AMERICAN BUILDER
and
BUILDING AGE

IS THE BUSINESS JOURNAL OF THE ACTIVE MEN OF THE BUILDING INDUSTRY

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and
BUILDING AGE

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MAY, 1931

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MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS
AND OF THE ASSOCIATED BUSINESS PAPERS

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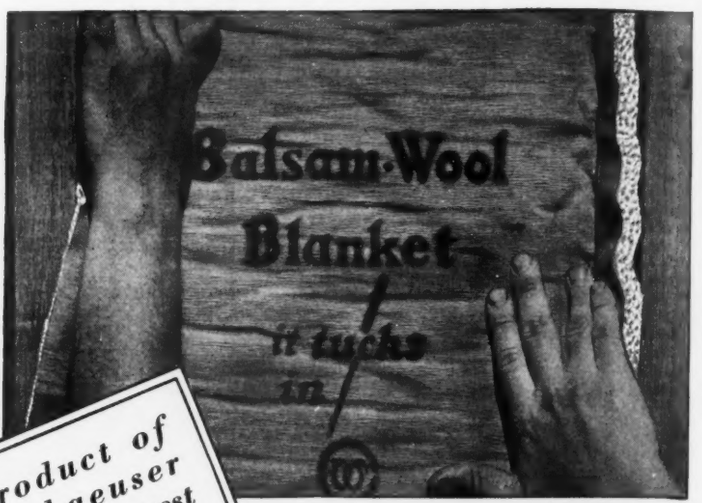

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Easy to fit snug! *Made extra wide for easy flanging between studding, joists or rafters. Scored on both sides for easy application. Flexible—calks every sized opening with amazing ease*

Easy to handle! *Photograph (right) shows how easily one man carries 250 square feet of Balsam-Wool. Roll opens in a jiffy with a patented opening device. Comes wrapped and sealed—always in perfect condition*

BUILDERS who use it say there is no easier way to build *true insulation* into houses than this! Install 1" Balsam-Wool!

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This year, with Balsam-Wool lining your houses, Balsam-Wool national advertising is making it easier for you to interest prospects, land contracts, or sell houses.

Watch this powerful campaign during 1931! See how it is warning people against the *costly mistake* of building or buying a house that is not protected with *true insulation*.

Let this warning work for you! Give your houses *true insulation* with Balsam-Wool. Thus—you assure customers that *you protect them* against the costly mistake so many home owners make.

Ask your lumber dealer for samples of Balsam-Wool—also samples of Nu-Wood, the all wood insulating wall board and V-joint lath. Send coupon for information on how to install them in all types of houses.

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Cloquet, Minnesota

Please send me samples of Balsam-Wool and Nu-Wood together with complete information on how to apply them.

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A guaranteed Weyerhaeuser product

Balsam-Wool Blanket

THICK . . . FLEXIBLE INSULATION . . . EFFICIENT

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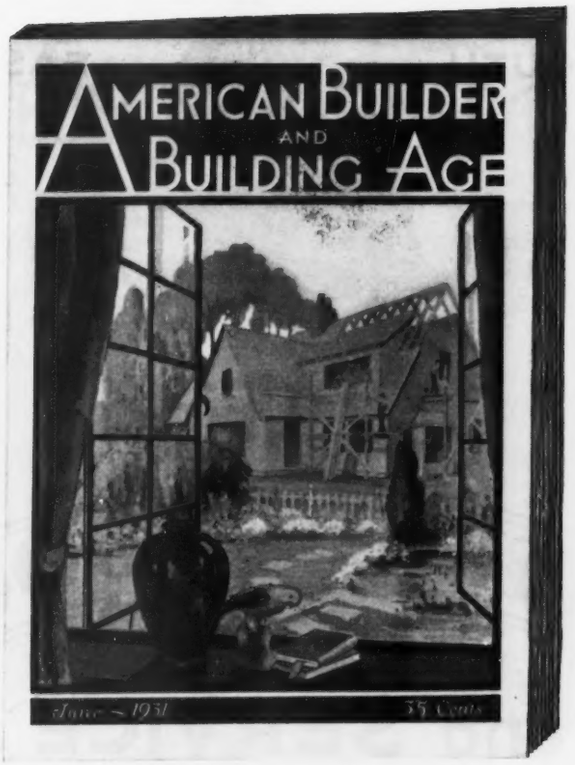

LOOKING AHEAD WITH THE EDITORS

June, 1931

New Series on Low Cost Homes

CRITICS of the building industry say that builders must reduce the cost of homes to the point where the average man can buy one. How is this to be done? Must we develop some radically new method of construction? What can the individual builder do to cut the costs?

These and other phases of the problem will be taken up in a series of three articles starting with June which will attempt to give a broad view of the important trends in low cost housing today.

In order to give a good general picture of the factors involved in housing costs, the first article will discuss land values, improvement costs, financing charges and taxation. The second article will take up some revolutionary methods of construction that have been advocated as a solution of the problem, and will also deal with the practical problems that builders have to face in satisfying popular demand. The third article of this series will analyze the ways in which builders can reduce costs, and will describe and illustrate some successful projects where these methods have been used.

Providing low cost homes for the millions of moderate income presents the biggest opportunity in many localities for a successful season.

As a prelude to this important series starting next month, see pages 72 and 73 of this magazine where the layout, construction cost and buying budget of a $2200 home are described—The Editors.

NORTH. . . SOUTH

EAST, . . . WEST

You'll Find

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Standard stock design, five center stile, top panels in glass. Can be operated with ease by a child; however, The "Overhead Door" Electric Control may be had if positive electric operation is wanted. Operating key switches may be placed at any desired point. Lights in and about the garage may be lighted automatically with the operation of the door.

For Ten Years — The Standard of Comparison

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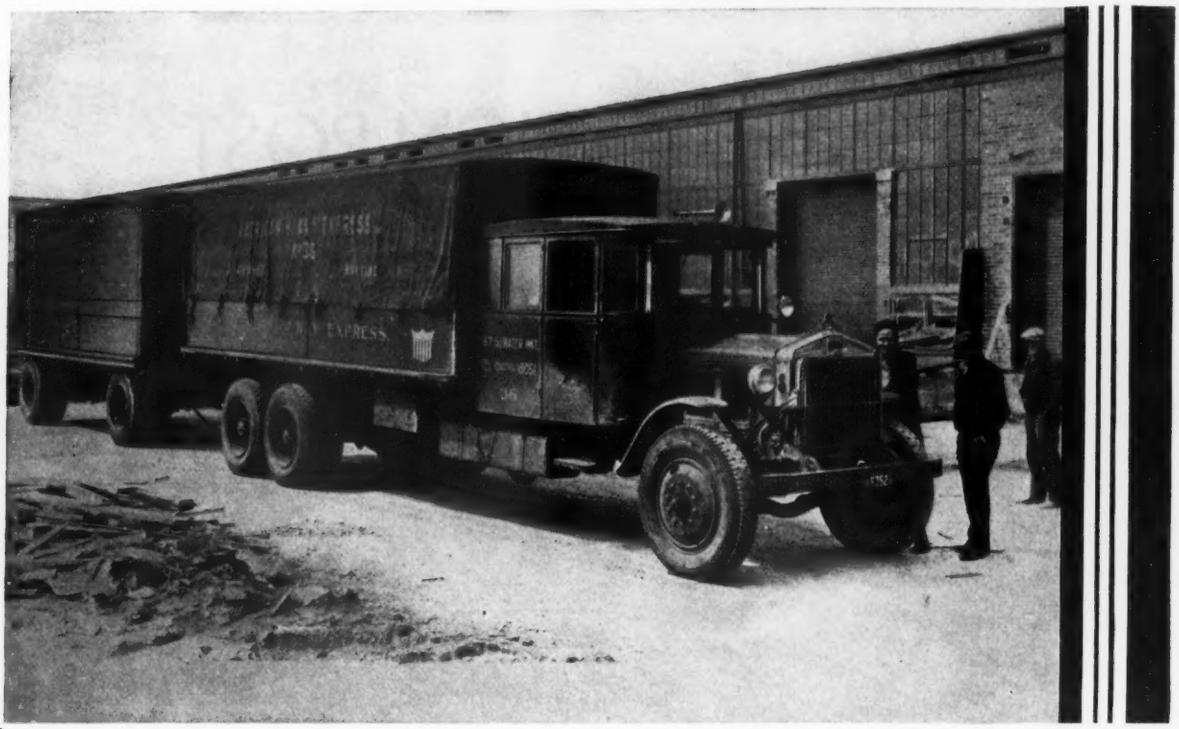

Driveway of Bendix Aviation Corp., South Bend, Ind. H. G. Christman Co., South Bend, contractor

3 days after placing . . . . . 15-ton trucks used this High-Early-Strength driveway

Again and again, high-early-strength concrete made with Universal Atlas methods and cement saves valuable working hours for industrial concerns. It thereby builds good will for the engineer and contractor.

High-early-strength concrete made with Universal Atlas methods and cement reaches a compressive strength of more than 2000 lbs. per sq. in. in from 2 to 4 days. Concrete as ordinarily mixed and placed requires 14 to 28 days to reach this strength. In addition to saving time, this high-early-strength concrete is more durable and watertight.

Use the coupon for booklet describing in detail methods for securing high-early-strength concrete with Universal Atlas cements.

68

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208 South La Salle St., Chicago
Without obligation, please send me booklet describing in detail methods for securing Universal Atlas high-early-strength concrete.
A.B. 6-31

Universal Atlas Cement Co.

Subsidiary of United States Steel Corporation

Concrete for Permanence

FOR ADVERTISERS' INDEX SEE NEXT TO LAST PAGE

AMERICAN BUILDER
AND
BUILDING AGE

IN DEFENSE OF BUILDERS

WE have no objection to the architectural profession advertising "Consult an architect." It is a veteran slogan, well tried by time and the many advertisers who have used it, and the public has learned to appreciate it through long acquaintance. Builders might use it to advantage, as we pointed out in a recent editorial, although it has been suggested that this would be an unkind encroachment on the domain now pre-empted by the architect. Theologians, too, might increase public appreciation of their services by advertising "When in doubt, consult your pastor;" it would also be interesting to see a gigantic combine of morticians startling the nation with "Before you die, consult an undertaker."

We repeat, we have no quarrel with this slogan; but we do deplore the tendency of many architects to couple with it—either impliedly or otherwise—something like "You can't trust a builder." There has been too much said of late that is derogatory to builders. We contend that the vast majority of builders are honest, reliable, know their job, and can be trusted to carry out an agreement fairly and squarely. We contend that there are no more crooks or incompetents among builders than among architects or any other profession; and we are sure that such types cannot maintain a position long in either profession in competition with honest, competent men.

Discussion of this slogan has brought out the attitude of some architects that they are the *only* ones qualified to render a fair and impartial opinion on building matters or the selection of building materials. This we strenuously deny. An example of this state of mind is contained in a letter written by H. Roy Kelley, Secretary of the Southern California Chapter of the A. I. A., published recently in a prominent magazine edited for architects. Says Architect Kelley:

"Enclosed is a page . . . which deals with this same matter, [Advertising of "Consult an architect" by manufacturers of building materials] but to a certain extent in a rather unfortunate way. I refer particularly to the advertisement of the ———— Company which says 'Consult your architect, builder and lumber dealer.' This, of course, defeats the entire purpose that we have in mind. The point that we would like to have stressed is that the architect, and presumably in some cases the engineer, are the only people to consult if an unbiased opinion in connection with a given material is desired.

"Whereas, the lumber dealer or the builder can hardly be expected to have an unbiased opinion in the true sense of the word. Furthermore, we think it important that there should be no suggestion of endorsement conveyed in the advertising matter, but rather that the architect should be consulted for the proper use of the particular material. In fact, a slogan such as 'Consult your Architect for the Proper Use of This Material' would probably express our feelings about as clearly as anything that comes to mind."

Others, Also, Are Men of Integrity and Have Knowledge Based on Experience

Mr. Kelley, in his enthusiasm for the remarkable fair-mindedness and judgment of the architect, excludes not only the lumber dealer and the builder, but also the manufacturer, who presumably has spent considerable time and money in developing his product for the specified uses he advertises. No one of these, he says, can give "an unbiased opinion." Notwithstanding our very real admiration for the abilities of the architect, we feel that this is carrying matters too far. After all, the builder *does* learn something about the use of build-

ing materials in his daily work. We might even venture to suggest that quite frequently the continued, practical application of a material may give him a better knowledge of its values and limitations than is possessed by the architectural draftsman who specified it. Also, it seems only fair to the manufacturers, whose engineering and research departments have been responsible for practically all of the many improvements that have been made in building materials and equipment in the past twenty years, to admit that they probably know something about their proper use.

We hold that if manufacturers are going to spend their advertising dollars promoting any profession, or the slogan of any profession, the builder is entitled to equal consideration with the architect.

AND THE BUILDER IS BLAMED!

WHO is to blame when a completed house bears no more resemblance to the architect's rendering than a mail-order suit of clothes does to its natty picture in the catalog? There is considerable difference of opinion. The architect, of course, blames it on the builder, saying if he had followed instructions the house would have borne at least a faint resemblance to the picture.

The builder, quite naturally, sometimes resents this accusation and points out that no one, short of a magician could have made the house look like the picture by using the plans provided by the architect.

This brings us to a point about which we have long wanted to say something: namely, that builders are too frequently kicked, knocked down, and thrown about the lot by persons who blame them for something that is not their fault. It is impossible to make a house look like some architectural renderings. The drawing, with its beautifully obscured details, overemphasized features, mythical foliage, and artistic lights and shadows is a good selling feature. But when the house fails to live up to this ideal, it cannot always be said it is the builder's fault.

Greater accuracy in the picturing of proposed houses will benefit everyone concerned. Builders who do their own renderings are just as guilty as anyone else—only perhaps their drawing ability is not as great as that of the water-color experts in an architect's office. Drawings that obscure weak architecture, misrepresent facts, or mislead the purchaser are unquestionably dishonest. In the long run they will destroy more business than they create.

FOR THE LOCAL INDUSTRIES

THERE should be no doubt or uncertainty in the mind of anyone as to where this publication stands in the fight that the local builders and dealers are making to retain control of the home building and home modernizing market in spite of the encroachments of the big mail-order concerns. We have written, talked and published much on this subject of out-of-town competition, pointing out its menace and also the lessons which local builders and dealers can profitably learn from some of the methods used by these huge concerns in their merchandising and home financing.

The following letters, which recently passed between our office and that of a prominent eastern lumber dealer, again state our position:

March 19, 1931.

Editor AMERICAN BUILDER AND BUILDING AGE:

We have been approached by your Mr. ———, who is also field representative of the Northeastern Retail Lumbermen's Association, with the idea of interesting us in placing in the hands of our contractors your magazine, AMERICAN BUILDER AND BUILDING AGE. We are a member of the Association and we use the Association's plan books, blue prints, etc.

Will you kindly advise us if you are behind the retailers of the country in their fight; and do you believe and is it your policy, that lumber, builders' supplies, etc., should be merchandised through a representative local retailer who carries a complete stock for the benefit of the community?

Do any of your articles in the AMERICAN BUILDER AND BUILDING AGE tend to favor out-of-town and ready-cut buying?

Signed ———.

Answer:

March 21, 1931.

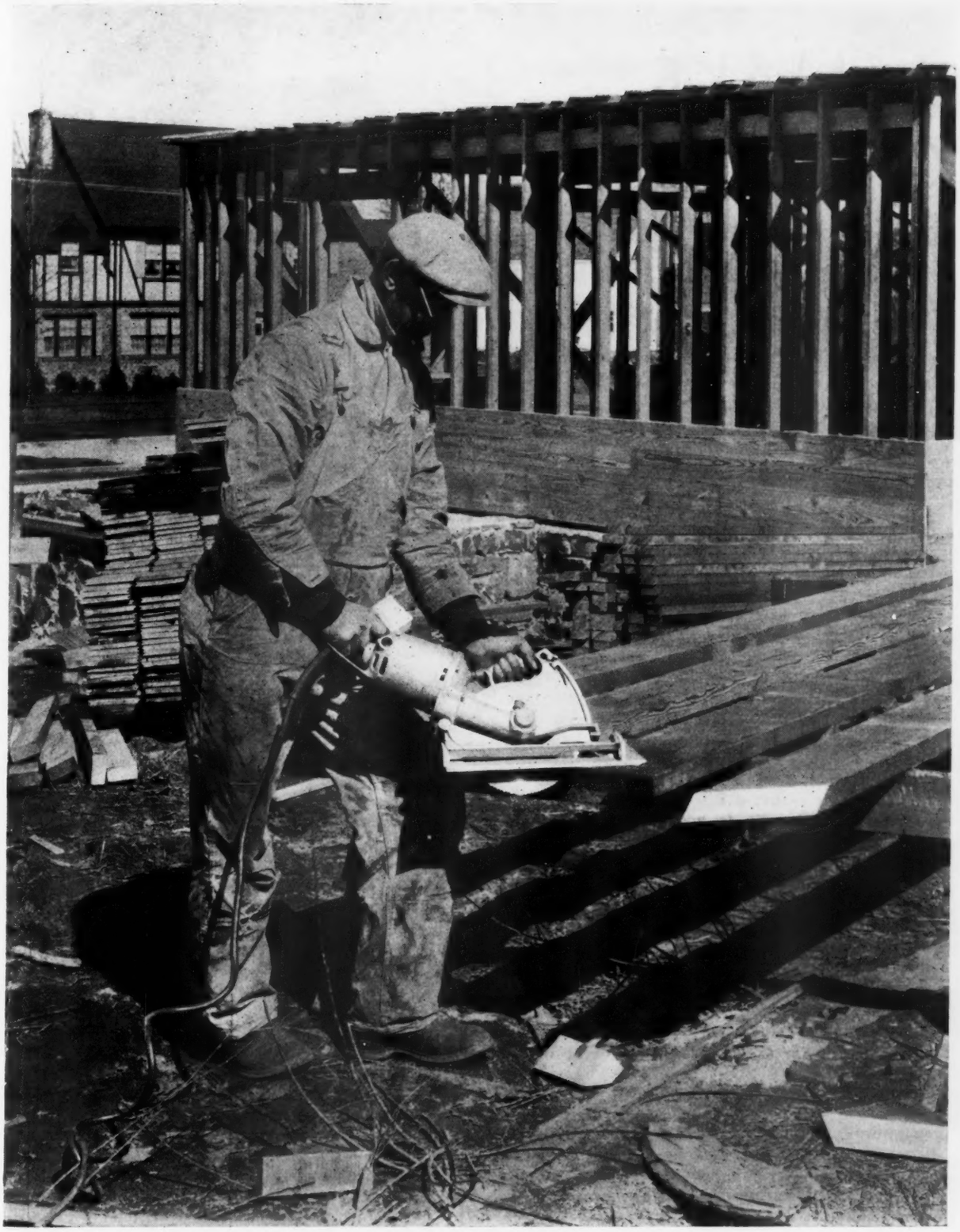
It gives us great pleasure to reply to your letter of March 19th, relative to our editorial and business policy.

To the best of our knowledge, AMERICAN BUILDER was the first publication to take a stand editorially *against* mail-order entry into the building business. This was followed a month later by a similar stand on the part of *Building Age,* which publication then proceeded to conduct a prize competition for the best method of combating such competition. With the merging of these two publications into the present AMERICAN BUILDER AND BUILDING AGE, there was therefore no editorial conflict; and we are continuing in our original policy. We have published a number of editorials and articles on the subject of mail-order competition and how such competition is being met by progressive dealers and builders over the country.

This publication has always stood for the promotion of the building business in all of its phases by local factors. Hence, it is quite apparent that our stand is for the retailers and for the retailing of lumber and builders' supplies of every sort through representative dealers in each local community. Similarly, it is our belief and preachment that each community is best served by the placing of construction work in the hands of local builders.

It may interest you to know that from a business point of view we have refused many thousands of dollars of advertising from mail-order houses, for the simple reason that we do not believe that the building industry will be helped in any way by the further expansion of their efforts.

AMERICAN BUILDER AND BUILDING AGE.



What is this man doing?—He is

CUTTING COSTS

"Saw the timbers on the ground and with electric power"—is the rule which many builders are using to produce better work at less cost, and so reduce the price and broaden the market for good homes.

MAKE HOME-BUYING EASY!

A MAN comes into an office, is greeted by a courteous attendant, and says: "I am interested in buying a house."

"You have come to the right place", says the attendant. "Sit down for a moment and our Mr. Norcross will be out to give you all the information you want."

In a few moments Mr. Norcross appears. He is able, well-informed, intelligent, and a trained salesman. The prospective homebuyer tells him his story:

"You see, Mr. Norcross, I have a lot out in Riverside Park that I have been buying for quite a while. I have it all paid for now, and want to put up a house on it as soon as possible while prices are low—something around $6,000." He hesitates a moment, and adds:

"To be frank, Mr. Norcross, I don't know much about building. I don't know anything about construction details, materials, sub-contracts, all that. I haven't time to bother about learning now. I heard that you folks will take over all the details of construction, supervision, financing, etc.—that all I have to do is select my house and you will do the rest. That's why I came to you."

A little while later this man has selected from a book of plans a simple colonial cottage that falls within his price range. The salesman then outlines an amazingly simple and easy home purchase plan.

"Just come with me and take a look at these fixtures," the salesman says. "All you have to do is walk around our showroom and select your heating plant, plumbing fixtures, building hardware, decorative scheme, and any other items that you would prefer to select yourself rather than leave to our judgment, although we'll be glad to do it for you. If you have the time, we'll drive right up to Riverside Park and you can tell me exactly where you want the house located.

"When your decisions have been made and you are ready to go ahead, you can give us a check of $400. In four months you will commence monthly payments of $47.94. In the meantime all you have to do is to forget the whole matter. When your house is completed exactly as the plan you have selected provides, and is fully equipped with the products you have chosen, we will mail you the key to the finished home."

* * * *

The above conversation might have taken place in some Home Builders' Utopia, where contractors had really learned *to make home buying easy*. It *might* have. But actually it is an accurate recital of a painless selling drama enacted in the Eastern showroom of a large mail order organization.

You can't criticize that kind of selling. In fact, it would be a foolish waste of time to do so. Instead of looking for flaws, the thing to do is to study the time-proven merchandising methods involved. This company is only putting into practice the modern selling methods that have enabled the automobile, radio, and other "luxury" industries to sell rings around the building industry. They have no monopoly on skillful selling.

To compete successfully for the American public's buying dollar today, contractors and builders must make it easy for interested persons to build and own a home—far easier than they ever have in the past. Think of the difficulties that beset most would-be home builders as it is now. Think of the numerous decisions on unfamiliar matters that they must make, of the scattered sources from which they must secure information on building products, the perplexing maze of details in connection with getting the design, arranging the financing, buying materials. No wonder there are hundreds in every community like the business man who told a certain lumber dealer that he was too busy to build, and that a house ready built seemed the solution of his need. He had been to see a real estate agent who had spoken about as follows:

"As a businessman you will want to do this on a businesslike basis; that is, by getting bids on the whole job from various contractors, or separating the job yourself in getting bids on the various phases of the work. In any case, there must be several bidders on mason work, carpenter work, electrical work, painting and decorating, plumbing, heating, and a few others—anywhere from fifteen to eighteen parties who must be pinned down to certain specifications. I don't think you can afford an architect, and if you select a general contractor who will see that all sub-contracts are carried

Competition in the Building Business Today Is Much More Than Rivalry Among Builders—It is a Fight for the American Home As Against the Automobile, the Radio and Other Widely Advertised, Highly Merchandised Luxuries.—Are you doing your share?

out, you will have to get one that won't charge too much for this supervision. Then there is the danger that your low bidders will try to skimp somewhere to get by. It's pretty discouraging business—you can't pay a big price and any other way you look at it you will have more worry and time and money wasted than you can afford. You'd better buy a ready-built house."

While this is perhaps an unduly pessimistic picture, the fact remains that the building and owning of a home does impress many people as being a most difficult and complex procedure. This deterrent coupled with the fact that high pressure salesmen representing all manner of luxuries are right on the job to get their money, while men with houses for sale are not, is the determining factor that keeps them from building.

Make it easy, simple and practical for prospects to acquire well-built and satisfactory homes. This sounds like a simple formula. Let's see how it can be put into effect. It may be done in a number of ways, depending on the size of the contractor's business and local conditions.

The Contractor Does It All

First let us consider the contractor with a well-organized, rather extensive business, who has considerable capital and good financial standing. It should be possible for him to handle all the steps necessary to the building of a home. He will have his own architectural department, backed up by numerous sets of plans which may meet a customer's needs without change, or may be modified by his draftsmen.

Such a builder will be a patron in good standing of a strong building supply dealer, who will see to it that his (the builder's) office or showroom is well-stocked with simples of various materials and types of equipment. Thus the customer may make his selection right in the builder's office or be taken over to the supply house where a wider selection is available. This builder, because he is well-financed, will be able to sell houses on a small down-payment, possibly selling his amply secured first mortgages to individuals or financial institutions. It will not be necessary for him to dispose of his second mortgages at a high discount rate.

Here, then, is a contractor with all the processes of home-building under his control. He can advertise "We take all the responsibility and do all the work." He can in every respect carry out the selling conversation described at the beginning of this article. He has a great advantage over the mail order houses, because he is right on the job, familiar with local conditions, and able to "follow through" to see that his customer is fully satisfied.

The Building Supply Man Helps Out

To the contractor who, for various reasons, is unable to handle all the financing himself, another and equally satisfactory course is open. This is through co-operation with his building supply dealer, where the dealer is able to handle the financing. The Associated Leaders of Lumber and Fuel Dealers recently organized a finance corporation which make it possible for them to provide funds for first and second mortgages up to 75 per cent of the value of the property, payable in equal monthly installments over a five to fifteen year period. This plan, fully described in the January AMERICAN BUILDER AND BUILDING AGE, enables the dealer to turn his mortgages over to the finance company, so that he can finance home-building on a large scale.

The contractor who has a working agreement with such a supply man can assist the customer to select his design, arrange to have him pick out materials and equipment from the dealer's showroom, and arrange his financing through the dealer. Thus the builder and dealer, working together, are able to relieve the prospective home-buyer of all worry and accomplish the goal set at the beginning of this article.

The Architect May Do It Too

The editor of the *American Architect* in a recent editorial says: "Architects are qualified and capable of handling all of the details essential to the acquiring of a site and completed house. Yet, how many architects intelligently combine all of these functions into one service that gives an owner what he wants with a minimum

(Continued to page 126)

PRIZE WINNING DESIGNS

Better Homes In America selects attractive small houses in contest to stimulate interest in improved planning and building

Are You Co-operating?

IN 7222 communities last year, Better Homes Campaigns were conducted by local committees affiliated with Better Homes in America, a nation-wide organization headed by President Hoover, Ray Lyman Wilbur, civic and home-making leaders and groups.

ITS PURPOSE is to help the American people to higher standards of housing and home life. It is the promoter of Better Homes Week.

YOU SHOULD be identified with your town's committee, both because this is a worthy movement and because it will help you determine trends in home standards in your community.

DR. RAY LYMAN WILBUR, President of Better Homes in America, recently announced the winners of that organization's first annual small house architectural competition. The editors of AMERICAN BUILDER AND BUILDING AGE are pleased to present the winning designs on the following pages.

The gold medal in the one-story class was awarded to Reginald D. Johnson, architect of Los Angeles, for the attractive bungalow shown on Page 58. The jury, composed of architects F. L. Ackerman of New York City, George Howe of Philadelphia, W. J. Sayward, of Atlanta, E. S. Porter and Ward Brown of Washington, D. C., said that they felt this house was "of an architectural character that readily lent itself to a wide geographical application; that it was extremely simple in character, charming in detail, and an excellent piece of design in harmony with a most fortunate setting."

No medals were awarded in the one and a half and two-story groups, as the jury apparently felt that none of the designs submitted established a high enough medal standard. Honorable mention was given to several competitors and these designs are illustrated on the following pages.

Better Homes in America is an educational institution for public service in the interest of home improvement initiated in 1922 by Mrs. William Brown Meloney and an advisory council of which Calvin Coolidge was honorary head and Herbert Hoover chairman. Begun as a private enterprice, the movement became a force of such importance that in 1923 it was reorganized on a permanent basis, with Herbert Hoover as president and James Ford as executive director; headquarters were set up in Washington.

The movement has spread to all parts of the country, where Better Homes Campaigns are conducted by voluntary local committees led by chairmen appointed each year by the Washington headquarters.

Local Better Homes Campaigns consist of publicity, lectures, discussion meetings, contests, and exhibits. Wherever possible they also include, during Better Homes Week, the demonstration of a house planned and furnished for a family of modest means, illustrating the best that the community can offer in home comfort, convenience, and beauty at a cost within the reach of families in moderate circumstances. Last year 7222 communities conducted campaigns which usually culminated in national Better Homes Week, which this year will be from April 26th to May 2nd.

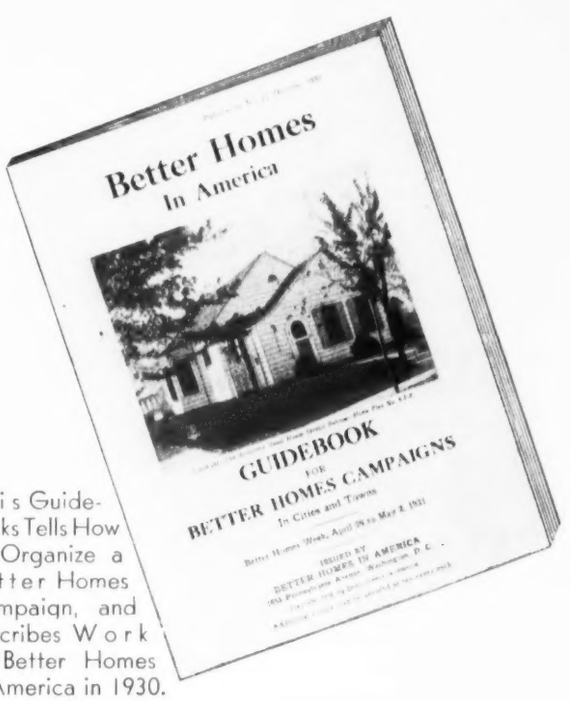
Builders are urged to co-operate in every way possible with the Better Homes organization in their community. The work of the local committees is of a type that should be of first-hand interest and importance to contractors and builders. Not only will they perform a valuable service to the community in placing their knowledge of home-building at the disposal of the Better Homes Committee, but they will profit from contact with people so actively interested in home-building. They will be able to discover the latest trends and keep their houses so modern as to merit the approval of the group.

The purpose of Better Homes in America will meet the approval of every builder; stated briefly, a few of them are:

To make accessible to all citizens knowledge of high standards in house building, home furnishing, and home life.

To encourage the building of sound, beautiful, single-family houses; and to encourage the reconditioning and remodeling of old houses.

To encourage thrift for home ownership, and to spread knowledge of methods of financing the purchase or building of a home.



This Guide-Books Tells How to Organize a Better Homes Campaign, and Describes Work of Better Homes in America in 1930.

DETAIL, Donald D. McMurray, Architect Haight Photo.

ON This and the Following Pages Are Shown the mall Homes Selected by Judges as Winners of he Better Homes in America Competition. They lustrate a trend towards compact arrangement, ttractive exterior design, and quality construction. hey are suitable, with slight modifications, to prac- ally any part of the country, and are worthy of tudy as indicators of architectural development.

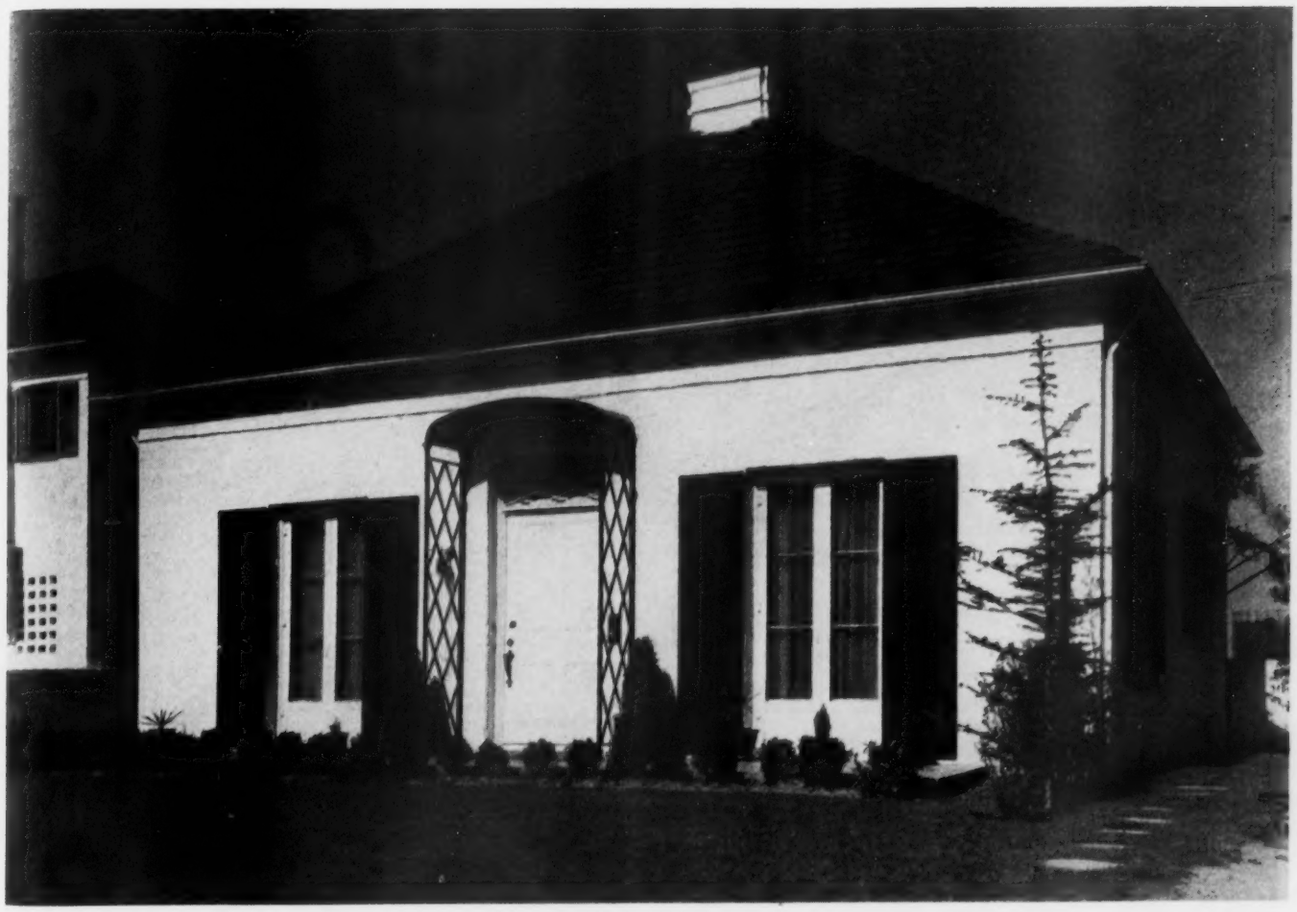
THE JUDGES' SELECTIONS

Haight Photo.

The Gold Medal Winner, One-Story Class, Designed by Reginald D. Johnson, Los Angeles, California. Although small and inexpensive, it has many features to recommend it such as the large airy living-room with porch in front and garden or patio behind; well-ventilated and lighted rooms, and convenient arrangement throughout.

PRIZE WINNING DESIGNS

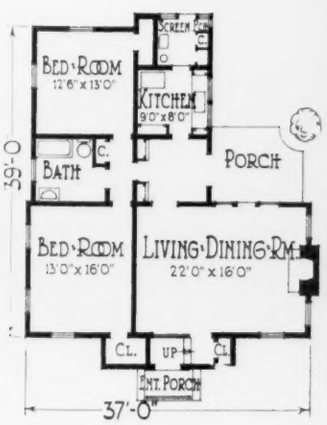
Honorable Mention, C. C. Merritt, Larchmont, N. Y.—charming and well-proportioned. The broad roof expanse makes the house hug the ground. Field stone is combined with shingles attractively.



Haight

Honorable Mention in One-Story Class, Roland E. Coate, Los Angeles, Architect. This house illustrates what can be done in the low-cost field by developers, being erected in Liemert Park project. Large windows, well-proportioned rooms, lack of waste space, and cross-ventilation throughout are good features.

This Pleasant Cottage, Designed by Donald D. McMurray, Pasadena, Calif., Received Honorable Mention. The design shows study of arrangement that has resulted in a convenient, comfortable house. The small dinette opening upon a porch is an unusual but attractive feature, as is the screened-porch at rear.

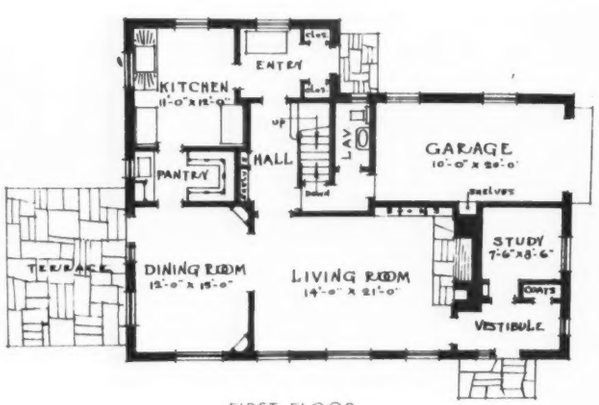


Haight

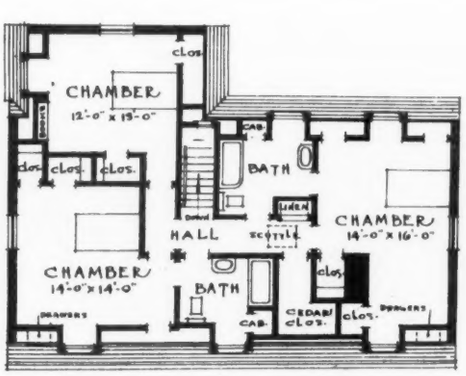
Myers Photo.

ONE AND ONE HALF STORY WINNER

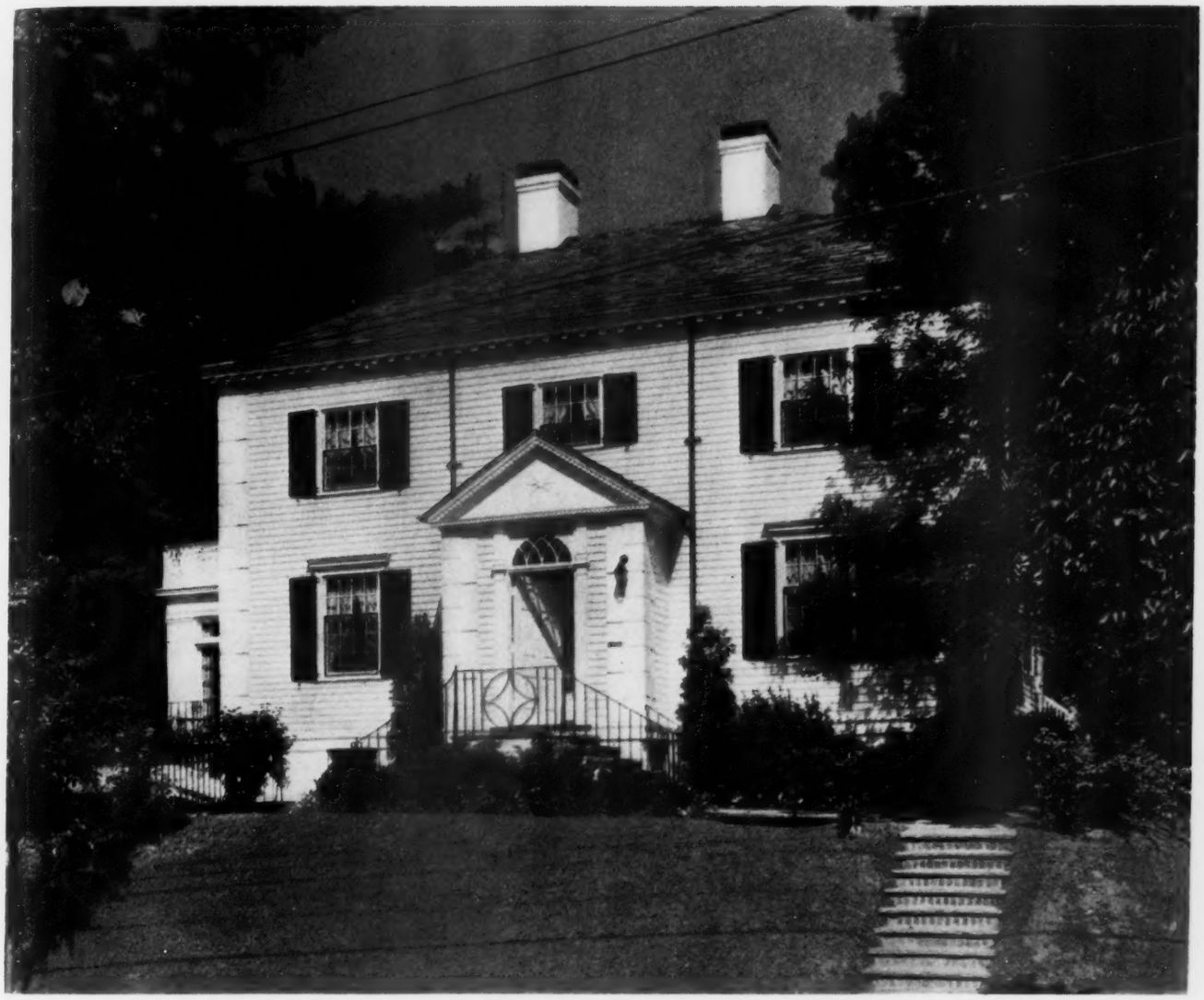
Honorable Mention Was Given This Design by Raymond J. Percival, Hartford, Conn. It is a roomy, well planned house that hugs the hillside as though part of it. The living room-dining room combination, with fireplace at one end and terrace at the other is appealing.



FIRST FLOOR



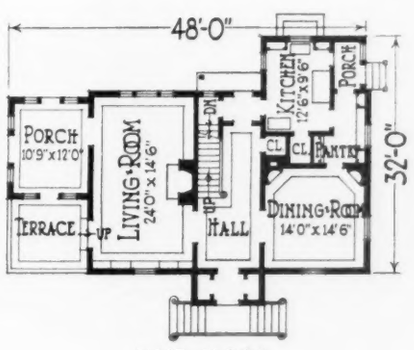
SECOND FLOOR



Gottscho photo

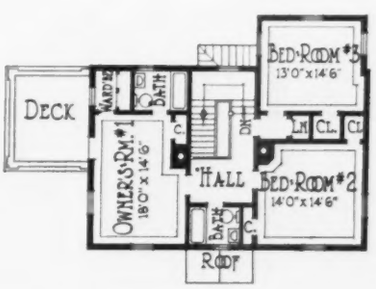
TWO STORY COLONIAL LEADS CLASS

Dwight James Baum, New York Architect, Received Honorable Mention for This Attractive Colonial. The exterior of white clapboards, green shutters, black ironwork and root of variegated blues and greens carries out conventional Colonial style. All stone and brickwork is whitewashed.

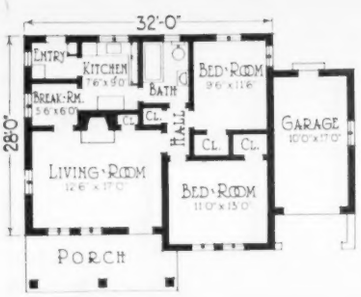


FIRST FLOOR

The Central Hall with Staircase is a Feature Liked by Many, as Well as the Large Living Room and Enclosed porch. Approximate cubage is 42,768 ft. Built in 1929 at cost of 62.6 cents per cu. ft.



SECOND FLOOR



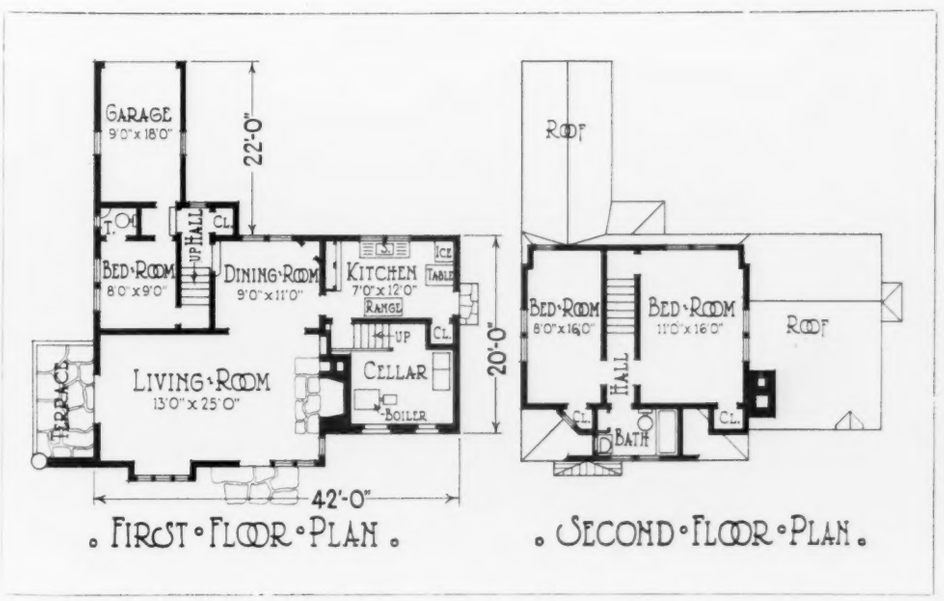
Designed by C. C. Merritt of Larchmont, N. Y., This House Received Honorable Mention. The stone and shingle exterior, bay windows, nice proportions and economical style are worthy of attention.

AWARDED HONORABLE MENTION

Another Honorable Mention from California, H. Roy Kelley, Architect. The floor plan is good; an unusual feature is the breakfast nook placement. Bathroom is conveniently located.

D. WENTWORTH WRIGHT, Architect

OUR FRONT COVER HOME



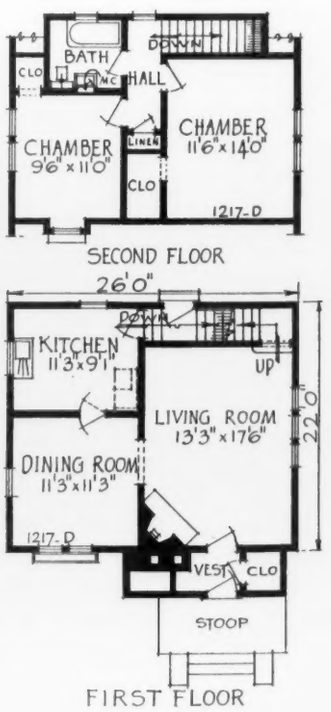
In Front of Such Homes as This One in Maplewood, New Jersey, Artists Love to Set Up Their Easels—as Witness Our Front Cover Sketch. And within, this house is just as interesting. The architect, D. Wentworth Wright, was also responsible for the charming "House of the Month" design we presented in the March issue.

Homes for The Many

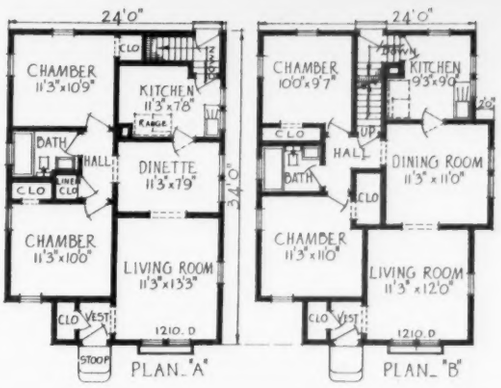
NATIONAL PLAN SERVICE Designs

Two different arrangements are suggested for the interior of the little Colonial bungalow pictured above. One of them an interesting "basementless" layout.

The quaint English cottage below is an ideal narrow-lot design.



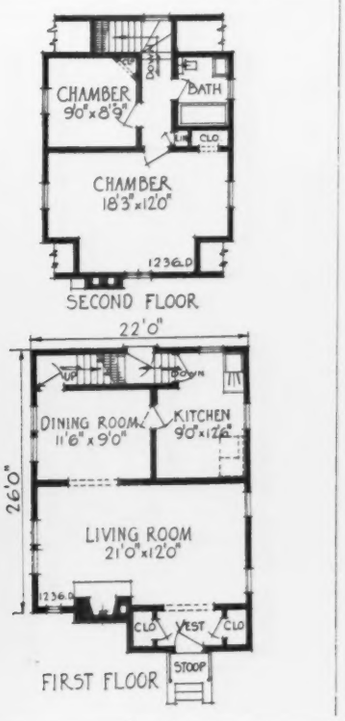
NATIONAL PLAN SERVICE Designs



Easy to Acquire
Easy to Occupy

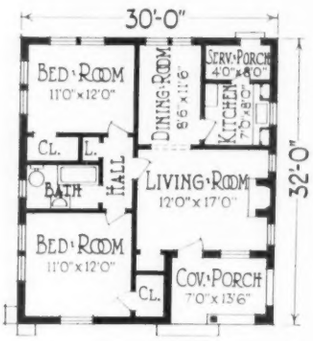
Here also alternate floor plans are available to fit the shingled cottage shown above. Each is a five-room layout.

Below is a charming five-room home only 22 feet wide.



The John W. Murphey Building Company was Awarded First Prize by the Tucson Real Estate Board for Best Designed House Built in 1930. Selling price was $7,500 with lot. The pleasing Spanish design, large patio, covered porch, and well-lighted, airy rooms are features that make this house especially suitable to a southern climate.

Murphey Built Prize Winner Sells at $7500

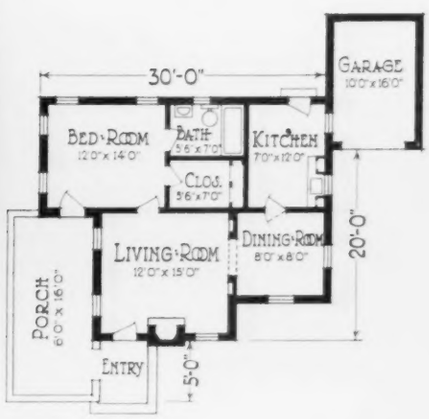


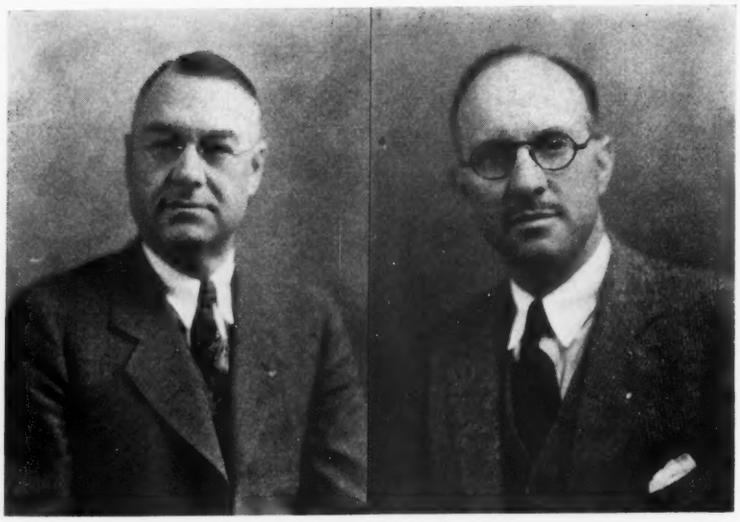
Although Small, This House of Unique Old Pueblo Design Has a Large Amount of Living Capacity. The selling price with lot was $5,385. Walls are of adobe construction with brown stucco. Designed and built by John W. Murphey Building Co.

This Six Room House with Garage was Built in Tucson, Arizona, by the John W. Murphey Building Company and Sold for Only $8,800 including lot. Large room, plenty of windows, heavy walls, insulated roof, and attractive, rambling Spanish style, make it desirable.

Spanish Type Homes Selling Under $9,000

The Large Chimney, Open Porch, and Well-proportioned Gables Contribute to the Success of This House Which was Designed and Built by the John W. Murphey Company of Tucson. The selling price, with lot, was $5,000.





Leo B. Keith (Left), Secretary-Treasurer; John W. Murphey (Right), President of Firm.

SUCCESS IN MADE THIS

AN ILLUMINATING ACCOUNT AN OFFICIAL OF A LIVE HOUSES IN TUCSON, ARIZ.,

By LEO B. KEITH, Sec'y-Treas.,

ONE OF THE most progressive communities of the Southwest is Tucson, Arizona—a city of 33,000—and its leading home builder is the John W. Murphey Building Company, the business of which is described in this article.

UNLIKE MANY, these builders came through the depression in excellent financial shape and are now ready to handle a big increase in business.

BECAUSE THIS REGION is a rapidly growing one, we feel it is of especial interest to our readers. This is the first of two articles prepared by Mr. Keith at our request taking up important problems of homebuilding in the Southwest.

—THE EDITORS

"HOW do you keep your organization running smoothly?" was one of the first questions put to me by the editor of AMERICAN BUILDER & BUILDING AGE when we were discussing this article. After thinking it over, I put down my reasons as follows:

First: Most of our men have been with the organization for many years; especially the *key* men.

Second: A sound financial condition due to conservative expansion.

Third: Thorough knowledge of the business by the man at the head of it.

Fourth: John W. Murphey personally inspects every job every day before coming to the office.

Fifth: The same superintendent has been on the job for twelve years, knows every detail of it, and is a thoroughly capable man. Henry G. Doe is his name, and he has followed this work all of his life, getting his first experience from his father who was a builder before him, and having some of the earlier large homes and buildings of Tucson to show as his work.

Sixth: The loyalty we give to and receive from our men.

John W. Murphey, president of the company, is a native son of Tucson, a graduate of the Tucson High School and of the University of Arizona; he is still a young man. He started in the building business 12 years ago, before his graduation in Engineering, and has since conducted the business. The John W. Murphey Building Company was incorporated in January, 1919. It is now the largest and oldest building organization in the city.

One of the chief reasons for this success is that the very nature of Mr. Murphey's business ability and integrity has been such as to attract and hold capable men, many of whom have seen long years of employment, and a number, such as Superintendent Doe, have had continuous service for as long as twelve years. For a good many years the number of men consistently employed the year around has remained steady with the volume of work approximately the same, although at various times of the year the ratio between buildings being erected for sale and buildings sold varies.

The average number of homes built per annum for several years was one and a half per week; then in 1929, which was a very good year, the volume was around three-quarters of a million dollars, consisting of a greater number of larger homes, warehouses, store buildings, bungalow cottages for resort hotels, etc. Last year's business was less volume and more and larger homes; total number of buildings to date would approximate about four hundred.

It is necessary for a builder to know the capabilities and limitations of his men, and if they are treated fairly and expected to give an honest day's work for a day's pay, they will do so. A weeding out process is constantly going on in our organization which results in the selection of those who will be constantly employed year after year in the same positions; they become specialists in certain work.

For example, when the concrete work is done, the men who lay the rough carpenter work go from one job to the next, doing the same work. Finishers do the same type of work on every house. Sometimes three are given one house and three more are given another house about the same and these men are checked against the other. Painters and all other classes of workmen are checked in the same way and all strive to keep costs down and know their work and time are being checked and observed. The same men do cabinet work on one job and go to the next one to do the built-in closets, dressing rooms, kitchen cabinets, etc.

The men know that doing their work a little better

HANDLING MEN BUSINESS GROW

OF MANAGEMENT METHODS BY FIRM THAT HAS BUILT 400 IN THE PAST 12 YEARS

JOHN W. MURPHEY BLDG. CO.

—HAPPY NEW YEAR—

We Wish at the Dawn of the New Year to Renew

A SERVICE PLEDGE

John W. Murphey designed and built homes are built to endure.

Furthermore they are guaranteed against either defective material or workmanship.

The service department of this organization is available to our home owners and our guarantee is unconditional. Should an occasion arise you will confer a favor on us if you will feel perfectly free to communicate with us.

A good percentage of new building is directly or indirectly the result of previous building done for satisfied owners, a number of whom we have built for several times.

The good will we foster has rebounded to the mutual benefit of all concerned. Nineteen hundred Twenty-nine was one of the best years in our history. Considerably over half a million dollars worth of construction being completed during the year.

Stability is one of the best valued assets of this organization and we have at this time underway more than $100,000.00 worth of building including a nine shop building at the corner of Fourth avenue and Fifth street which when completed will be the finest building of its kind in Tucson.

Considerable construction is underway and planned for the Palos Verdes Estates in the Catalina Mountain foothills, districts of which are proven citrus country and numerous magnificient building sites are now being developed. Interviews with prospective builders solicited.

John W. Murphey Building Company

211 North Fourth Avenue Phone 161

The "Service Pledge" of the Murphey Co. is Renewed Several Times Each Year in Quarter-Page Advertisements.

than seems necessary and keeping their time at a minimum means more business for us. Further they know that they are not working themselves out of a job, for they have other work to go to as soon as the one they are on is finished. We sub-let very little of our work. Organizing the men into small groups under foremen works out best. Here is our set-up:

All men under Henry G. Doe, Superintendent, with us continuously for over twelve years.

Brick men under Roy H. George, continuously in same position for four years. Men work in crews of four bricklayers and three helpers.

Carpenters under several competent men of years' service; one foreman on each group of one large or several smaller jobs. Men are split up according to work in hand: two or three work on foundations, six or eight on framing, two or three on finishing, two building cabinets, etc., two on frames, two on roofing. We usually have three or four young men as helpers, learning the carpenter trade.

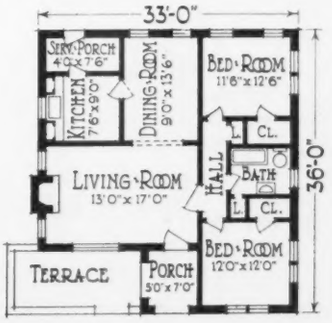
Electricians under Wm. R. Powers, who has held this position for several years. He has a crew of three men.

Laborers and truck drivers under Thomas Durkin, who has held the position for about six years. He superintends excavation, concrete work, etc., and usually has about 25 men split up serving on the various jobs.

Painters under experienced men. Our foreman died about Christmas and we have been trying out other men in our employ for the place. They work in crews of three or four and the number employed ranges from four to a dozen or more.

Plumbers are in charge of Richard W. Gould, who has held this position for several years. He has a crew of two or three men.

All foremen hire and fire their men and this without any interference from the office. The responsibility of



One of the Smaller Murphey-built Homes, Sold for $5,850.00, with Lot. The heavy walls, flat roof and floor plan are typical of the houses most popular in Tucson.

their work is placed squarely up to them. They know the aims, motives, costs, and profits of the work, and are instructed to handle affairs under their supervision as though they were their own.

Each Wednesday evening at 7:15 our foremen meet at the office and the work in process is talked over and problems discussed. Every foreman is expected to notify the next craft of the time they can come on to the job and each foreman has a box in the office in which instructions and messages are placed. These men come into the office at eight, twelve, and five each day.

Suggestions are welcomed from the men and they freely give them. They run their own departments without office interference.

In addition to Mr. Murphey and myself, the superintendent, foremen, and crews mentioned, we employ an architect, who does all our designing, a bookkeeper, and a stenographer.

I should not neglect to state that the vice-president of the firm is Helen G. Murphey, wife of John Murphey, and that she played an important part in building up the business. It is not every man that is as fortunate as John Murphey in having a wife who takes an active part in helping him make his business a success.

The chief aim and purpose of the John W. Murphey Building Company may briefly be stated as follows: "To furnish a livable, comfortable home at a reasonable price on terms that the average person can conveniently handle without a burden and in the end own a home worth every dollar that it cost."

When a home is being sold we endeavor to use every precaution as to the ability of the purchaser to pay and also as to the moral risk as well. This precaution, over a period of more than twelve years, has proven justified in that the company has never foreclosed a mortgage. It is true that from time to time houses have reverted back, but the percentage is infinitely small and such occurrences have been almost without exception merely a friendly turning over of the premises. It has been our policy to give every consideration, with the result that in most cases the equity the buyer had in the premises was used up to his benefit.

We finance homes practically 100 per cent. If a person has a well-located building lot, we will take it in as the only down payment on a house. The balance he can pay out on the basis of one per cent a month, which includes all interest and financing charges. In other words, on a $7,500 house the purchaser pays $75 per month. We find ready sales for our loans and they are highly regarded by investors, many of whom consistently buy our mortgages year after year, and to our knowledge, an investor has never lost a cent on a mortgage purchased of us.

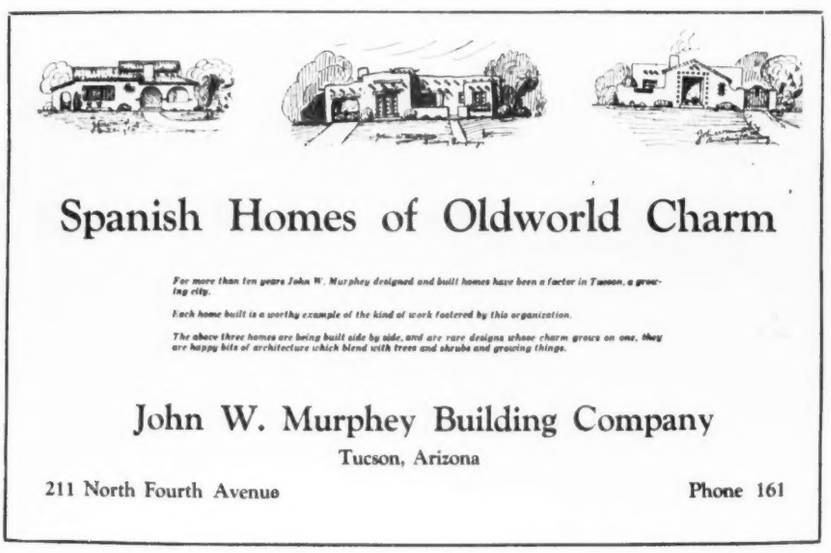
We have our own insurance department and the record of the insurance company is good, clean, new construction with a practically negligible fire loss history. Numerous single investors have purchased our paper and still own it in large quantities. Several own a hundred thousand dollars or more of our paper continuously and one client owns approximately a quarter of a million dollars worth. It is frequently our experience that some one single investor who has purchased our loans before will order enough mortgages to use up everything we have in this line for months at a time. This would seem to indicate, when the same people buy our paper year after year, that the experience they have with it is satisfactory.

First mortgages on Tucson property usually run about fifty per cent of the value of the property. Second mortgages and contracts are usually the hardest to dispose of, and while salable the discounts run as high as four per cent a year, so that a contract running six to seven years, which is about the average, is discounted up and down Congress Street and other financial marts at as high as thirty per cent, which usually is added on to the charge the buyer of the home has to pay.

We handle our contracts and second mortgages on a basis of never over ten per cent. Consequently we do not have to add as large an overhead on to the job for the buyer to assume. A large share of our contracts and second mortgages go to a local lumber company as collateral to our settlements made several times a year.

Most of our selling of houses is done by real estate firms. We pay a commission of five per cent on homes that are built for sale and on building jobs which they procure for us. We deal with all of the large reliable firms in Tucson, and they know that when they sell a job for us the transaction will be free from liens, that the bills for material and labor will be paid, and that we will still be in business to make good any defects that might arise.

While we do not do much advertising, at least once a year we carry a half-page ad in the local papers renewing our pledge of "standing by" our work. We service houses long after any legal responsibility has passed. This maintenance work costs us around $1,800 a year,


Spanish Homes of Oldworld Charm
For more than ten years John W. Murphey designed and built homes have been a factor in Tucson, a growing city.
Each home built is a worthy example of the kind of work fostered by this organization.
The above three homes are being built side by side, and are rare designs whose charm grows on one, they are happy bits of architecture which blend with trees and shrubs and growing things.
John W. Murphey Building Company
Tucson, Arizona
211 North Fourth Avenue
Phone 161

Next Month Mr. Kieth Will Describe Estimating, Checking, Cost Keeping and Construction Methods of The John W. Murphey Bldg. Co. This is an Article You Will Not Want to Miss

This Good-Will Advertisement, One-Third of a Page in Size, Helps Make Friends. Most Murphey selling is done through real estate firms, which receive a commission of 5%.

Built on the Outskirts of the City and Sold for $25,000 with Estate, This House Is Typical of Many Suburban Homes. The rambling floor plan is popular.

but is worth it in the satisfied customers it brings us.

We have built as many as eight homes for a single client; it is not unusual to build five for a client, and a great many have had several. Murphey-built homes erected over a period of twelve years are scattered by the hundreds all over Tucson, and people see and admire a certain place and come in and talk about one for themselves. Consequently much of our selling is done on the basis of work already sold. About once a year we have a house-opening which is well advertised, and these are usually very well attended.

Tucson is unique in that it has probably the most desirable climate in the United States. A newspaper article written by Mr. Arthur Brisbane, published under date of January 16, which is said to have a circulation of approximately twenty million, is summed up by the quotation: "If you are avaricious buy Tucson real estate wisely. If your health is unsatisfactory, live in Tucson and it will be better than ever. If you are well and want to live one hundred years more, spend your winters in Tucson."

(Continued to page 126)

A MURPHEY-BUILT HOME OF SPANISH CHARM

A HOME FOR $2200

The BIG OPPORTUNITY ahead is in building homes for the Millions of Moderate Income. Here is one that can be bought for One Dollar per Day!

Unquestionably the solution of the low-cost house problem lies equally with the architect, the builder and the house purchaser; the architect and the builder to plan more economically, the purchaser to content himself with a moderate, yet modern house.

By LEE M. WEAVER

THE problem of providing a home for the average workingman whose annual income does not exceed $1,500 has been one of vital importance for many years. Although considerable research has been made, ideas and plans of economists, architects and builders have been tried, no satisfactory solution has yet been perfected.

However, the fact is not overlooked that architects and builders have made commendable strides in improving the small house, making them more beautiful and convenient. Yet, practically all of these improvements have added to their cost, putting them out of the price range of the families of limited incomes. In contrast to this, a steady decline in wage earning during the past two years, has greatly increased the demand for less expensive homes.

Thousands of families have found it necessary to reduce their overhead in the same manner and perhaps in the same proportion as has the majority of large corporations throughout the country. In reducing this overhead, the item of shelter becomes of foremost importance. Less expensive living quarters must be provided; but unfortunately, few houses are available that will provide, at a lower cost, the modern conveniences and necessities to which they have been accustomed and to which they are entitled.

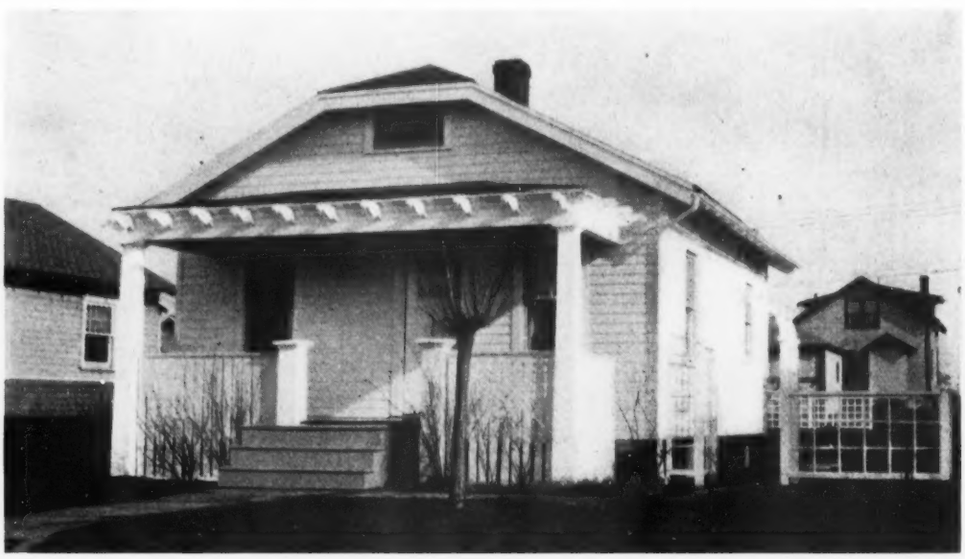
A forward step in the practical means of solving this problem is being undertaken by a prominent mid-west real estate and building organization, the Colpaert Realty Corp., South Bend, Ind., which has specialized in the production of low-cost houses for the past twelve years.

During the post war building program, this company built a considerable number of small four room houses to meet the prevailing shortage at that period. These houses were sold to workingmen on deferred payment contracts, providing for a small initial payment at the time of purchase and the balance in monthly installments amounting to little more than the then current rent value. The recent changes in the economic structure of the country found these purchasers without sufficient incomes to carry the obligations created, with the consequent result that a number of these houses were turned back to the builders. The company was then confronted with the problem of reselling them without sustaining a loss.

All are of regular frame construction, 22 by 26 feet, containing four rooms, full basement and attic; and the usual modern conveniences except the bath tub. The absence of this essential item was the chief objection to the resale or rental of the houses.

In seeking a solution to overcome this objection, a simple plan of modernization was perfected from which the accompanying floor plan was originated. This house can be built for $2,200, including a 10 by 18 foot detached garage.

The outstanding feature of the plan is the elimination of the bath room from the ground floor plan, which has



Tabulaton of Cost

Excavation and Grading	$ 23.85
Masonry and Concrete work	240.45
Lumber and Millwork	838.53
Carpentry	225.00
Lathing and Plastering	84.60
Electrical Wiring and Fixtures	64.80
Plumbing	225.00
Heating	108.50
Steel Beams, Sash, etc	$ 29.92
Hardware	32.90
Painting and Decorating	90.00
Sheet Metal Work	13.95
Landscaping	22.50
	$2,000.00
Plus 10% profit	200.00
	$2,200.00

been ingeniously built in the basement. Approximately $500 in the building cost can be saved by this unusual arrangement.

This house differs from the ordinary inexpensive home in that it is built of the same standard quality of construction, materials, and workmanship that is found in houses costing from $5,000 to $7,500. One or two features of construction will serve to show the quality of the house as compared with the usual inexpensive type houses.

The basement floor extends under the entire house and is provided with a 4 inch concrete floor, smoothly troweled and properly graded to a floor drain. In place of the commonly used built-up wood beam to carry the ground floor joists, a steel beam made up of two 3½" by 5½" by $\frac{5}{16}$" angles bolted together and supported by two steel columns are used. Three 9" by 14" three-light basement sash and a steel coal chute with a wire-glass door provide ample light.

Since the bath is in the basement this part of the house is made unusually bright and cheery. The concrete floor is enameled in a mauve color with a contrasting border, giving the effect of carpeting. The walls are painted in a light buff. The ceiling is sealed with plasterboard and painted in ivory, blending into the sidewalls and offering a pleasant contrast to the floors.

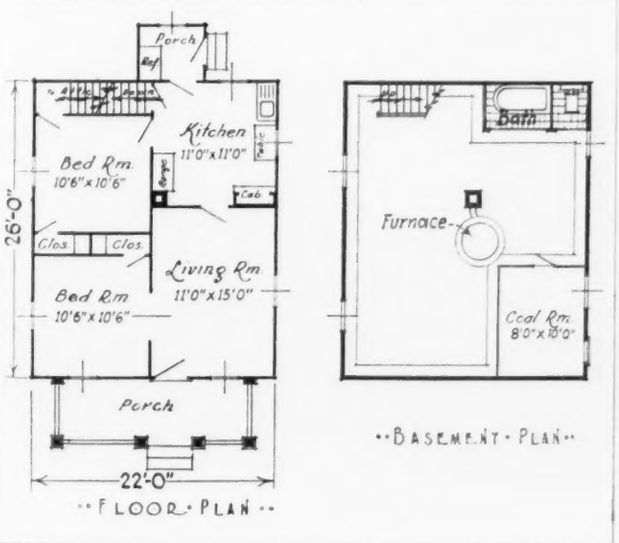
Colpaert Realty Corporation has been in the real estate and development work for the past eleven years, evolving from a one-man organization to one of the largest and most complete development organizations in Indiana. This company has assets of over four million dollars. They maintain their own engineering, architectural, construction, and sales departments. House units are plotted, planned, constructed, financed, and sold complete.

It should be explained that the cost, as computed on the schedule, is on a production basis.

The builder, in producing low-cost houses of this and similar types in volume, can operate on a much lower margin of profit.

Further, from 10 per cent to 20 per cent of the cost of the house may be saved through the elimination of waste.

Builders are not all cognizant of the tremendous waste that takes place in the ordinary construction of a house or group of houses. There is a waste of valuable time and materials in attempting to build without adequate specifications, detailed floor plans and elevations; a waste of time in the duplication of operations; inexperienced and careless workmen; laxity in scheduling of work and other similar details which the builder may discover by a careful analysis of his methods of operation.



Buying Budget

IN showing how this home can be realized and maintained on an annual income of $1,500, the following schedule is presented.

It is generally understood that, on a properly balanced budget, not more than one-quarter of the family income should be expended for shelter. Therefore, on an income of $1,500, the maximum to be spent for shelter is $375 per year. Assuming that the purchaser has at least one-third or $1,000 to pay on the purchase price of the house and the necessary furnishings, there is a balance of $2,000 to be financed. This may be done on the usual building and loan plan of mortgage, which provides for repayment in monthly installments of 1 per cent or $20 per month, including interest charges; amortizing the loan in about thirteen and one-half years.

Cost of house complete with garage	$2,200.00
Cost of lot	800.00
Total cost	3,000.00
Less initial payment	1,000.00
Balance to be financed	2,000.00
Annual cost for repairs, taxes ,etc.:	
Insurance	$ 6.41
Taxes	36.90
Upkeep (painting, repairs, etc.)	75.00
Payment on mortgage ($20.00 per month, including interest)	240.00
Total annual cost	$358.31

An efficient plan of group production has been worked out successfully by the company and is summarized as follows:

The building site is first selected. The architectural department prepares plans and specifications and a detailed cost estimate for each house in the group. Also a plot plan, showing set-back, outline of plantings, lattice fencing and location of garage. The building site is then surveyed and buildings located as shown on plot plan; and grade established.

These preliminaries are carefully checked before actual construction work is begun. Simultaneously, when construction starts, time schedules are prepared and each operation is held strictly to schedule, allowing of course for weather conditions.

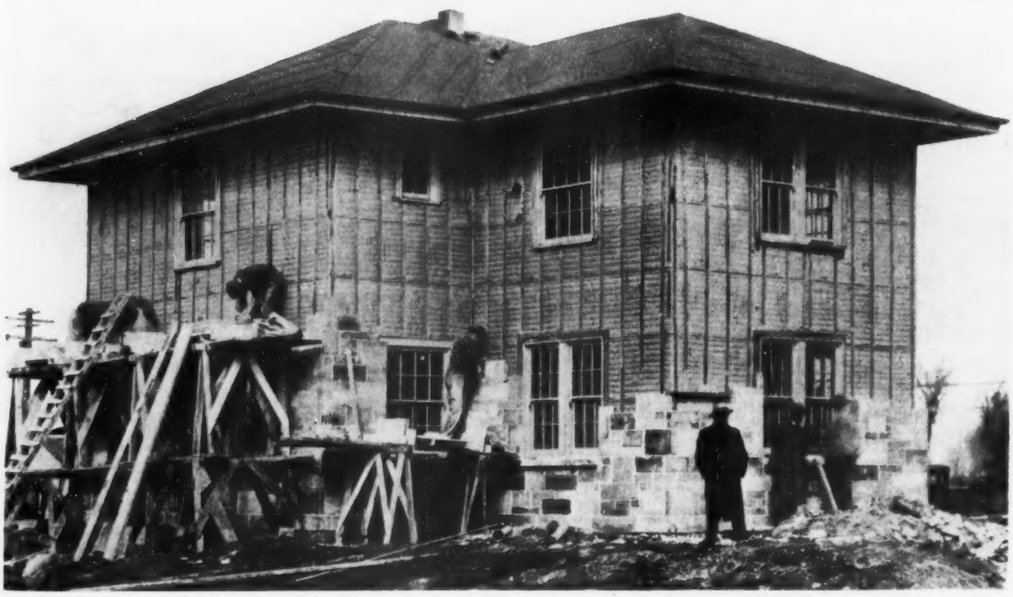
Operations are reduced to the least possible number without affecting the quality or efficiency of the work. After completing the first excavation, the team begins immediately on the next, and so on. The masons follow with the foundation walls. The team returns and grades around the foundation as soon as walls are completed. The first house is then ready for the rough carpenters who continue on down the streets from foundation to foundation. Then follow the other craftsmen, plumbers, electricians, lathers, plasterers, etc. Each gang of workmen performs one operation only. The interior trim is put on by regular interior men.

This plan has proved to be a very efficient and economical method of production, resulting in the highest quality of workmanship, because of the specialization of workmen to their respective trades.

Each crew of workmen is required to clean up after completion of their job. Finally, after painting and decorating, the lawn is seeded and shrubbery planted, and the completed house is then ready for sale.

EVERY INVESTMENT IN INSULATION PA

More Comfortable Buildings, Lower Fuel Costs, Better Satisfied Owners— Are the Products of Building Insulation



Placing Limestone Veneer over Walls of a House Completely Insulated with a Flexible Blanket Material to Produce a Home That Will Be Comfortable at All Times and Inexpensive to Heat.

ONE of the outstanding developments in the building field, during the last ten years, has been the rapid introduction and extensive promotion of new insulating materials, designed to prevent excessive heat-loss in winter, and to exclude excessive heat in summer.

Prior to 1920, only a few insulating materials were available on the market. The subject of insulation received scant attention from the building industry, and less from the public. Today there are about 40 companies manufacturing insulating materials. Many of these have been brought into existence and have grown to tremendous size in the production of these materials only. Others have gone into the production of insulating materials as a natural development of the allied activities in which they were already engaged.

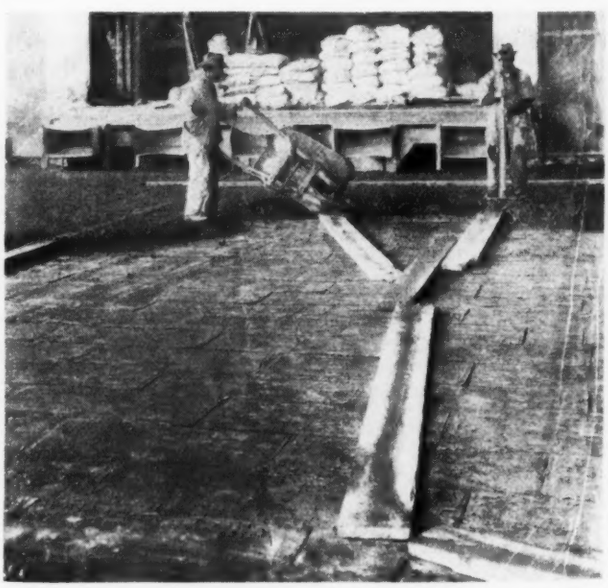
Insulation is now being so actively promoted that no one within the building industry would attempt to ignore it; and the public, especially the building public, is rapidly becoming "insulation conscious" as the advertising expert would put it.

In spite of the tremendous strides which have been made in these developments, and the tremendous volume of business which has been built up, the market for insulating materials has, so far, hardly been scratched. It will require years of educational work on the part of manufacturers, architects, builders, and contractors, and building material dealers, before thermal insulation is universally accepted as an essential of good construction, as it ultimately must be.

In the meantime, the rapid developments already referred to, have created a situation which requires clarifying. New materials have been coming on the market so fast, and in such number, that few of the active men of the industry are able to keep informed on all of them and their distinguishing characteristics. Therefore an analysis and tabulation of all available insulating materials should serve as a reference guide for further investigation. Such a tabulation is shown on pages 76, 78 and 80 of this month's magazine.

All thermal insulating materials now on the market are of one of three types and they are so grouped in the tabulation. These three type headings are: Rigid Board Materials; Flexible Blanket Materials; and Loose Fill Materials.

Under each heading are listed the trade or brand names of all products of that class. Under each brand name is given the name of the manufacturer, a brief statement of the material from which the product is made, the form, thicknesses and sizes in which it is supplied and, in the case of loose fill materials, the method of application.



A Floor Over the Ground, or Over an Unheated Space, Requires Insulation Under the Concrete.

ON PAYS DIVIDENDS

Fuel Savings Pay for Insulation Many Times Over

FUEL SAVINGS

Expressed in percentage of fuel which would have been required for similar house without insulation or weatherstripping.

	Saving
	Per Cent
No insulation, weatherstripped	15 to 20
Same, with double (storm) windows	25 to 30
1/2-inch insulation, not weatherstripped	20 to 30
1/2-inch insulation, weatherstripped	About 40
1/2-inch insulation, with double windows	About 50
1-inch insulation, not weatherstripped	30 to 40
1-inch insulation, weatherstripped	About 50
1-inch insulation, with double windows	About 60

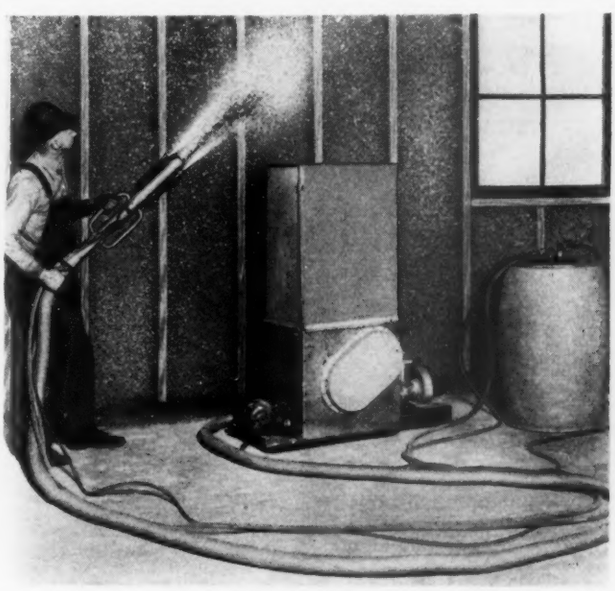
Expressed in percentage of fuel which would have been required for similar house without insulation, but with weatherstripping.

	Per Cent
With double windows, no insulation	10 to 15
1/2-inch insulation only	25 to 35
1/2-inch insulation, with double windows	40 to 45
1-inch insulation only	35 to 45
1-inch insulation, with double windows	50 to 55

Table I—Approximate fuel savings in dwelling houses.

The rigid boards are all composed of fibrous or granulated materials which have been compressed or felted into sheets or boards, more or less resembling lumber in appearance and general characteristics. In the case of the various vegetable fiber boards, which predominate in this list, the process of manufacture is very similar to that used in paper making. In some cases a mixture of fibers is used or animal hair is used with the vegetable fiber.

The various cork boards are made by granulating the cork, compressing it into slabs, and baking. Even



Insulation and Binding Material Blown Together Against a Wall to Which It Adheres Permanently.

Applying a Semi-Rigid Insulation Which Fits Between Rafters or Studs.

mineral wool, a fibrous mineral material made from the slag obtained in smelting metal ores, or from pure rock such as limestone, is compressed into the board form.

One board material varies from the common type. It is made from shredded wood which resembles fine shavings, instead of from wood fiber. This shredded wood is bound together in porous mass by means of a refractory cement which also serves as fireproofing.

Under the heading flexible blankets, is a smaller group of products which, in general are made somewhat like an ordinary bed comfort. They are composed of the various fibrous materials which, instead of being felted or compressed in board form, are matted between sheets of heavy paper of the kraft type. The paper is, in some of these products, waterproofed with asphalt or some similar material.

Mineral wool is made into the blanket form both between paper and between metal fabric, wire screening, etc. Still another type of fabrication uses burlap as a base, with vegetable fiber interlaced through it.

One of the vegetable fiber materials, which is classed with the flexible blanket materials, is actually a semi-rigid material made in the same way as the fiber boards. It possesses characteristics of both the rigid boards and the flexible blankets. It is also furnished in combination with metal lath, the two forming a single rigid unit providing insulation and plaster base in one.

The loose fill materials are all made from cork or from mineral substances, mineral wool or ground or flaky gypsum. The cork fills are simply ground cork such as is used in the manufacture of the corkboards, or reground cork trimmings.

Rigid Board Materials

ARBORITE ALL-WOOD INSULATING BOARD

Wood-Fibre Board Corp. Wood fiber (spruce and kindred species) felted, no chemical or waste material to alter natural wood characteristics; 1/2, 3/4, and 1 in. thick, made thicker than 1 in. with cemented or stapled joints. 4 ft. wide; 6, 7, 8, 9, 10, 11, and 12 ft. long; lath, 18x48 in. with long edges shiplapped; 2x5 ft. with square or offset edges.

ARMSTRONG'S CORKBOARD

Armstrong Cork & Insulation Co. Granulated cork, compressed into slabs and baked. 12x36 in. slabs, 1, 1 1/2, 2, 3, 4, and 6 in. thick.

BI-FLAX

Flax-li-num Insulating Co. Flax-li-num combined with flat expended metal lath; 1/2 and 1 in. thick; 24x48 in. with metal lath extending 1 inch at top and one side to form overlap joints.

CELOTEX

The Celotex Co. Sugar cane (Bagasse) fiber felted. 4 ft wide, 7 to 12 ft. long, 7/16 in. thick (one surface smooth, one textured) and 3/4 in. thick. Celotex lath 1/2 and 1 in. thick, 18 in. wide x 48 in. long, shiplapped beveled edges; tile board (one surface smooth, one textured), beveled edges. 7/16 and 13/16 in. thick, 6 in. x 12 in. to 24 in. x 32 in.

CERTAIN-TEED INSULATING BOARD

Certain-teed Products Corp. Laminated wood fiber board, five ply construction, six sheets to a ply, inert mineral earth with fine wood-screenings spread between laminations; 4 ft wide by 6 to 12 ft. long; 7/16 in. thick.

CORINCO CORKBOARD

Cork Insulation Co., Inc. Granulated cork, compressed in moulds and baked; 12 inches wide x 36 in. long; 1, 1 1/2, 2, 3, and 4 in. thick.

COMFERT INSULATING BOARD

Guyton & Cumfer Mfg. Co. Laminated wood fiber board, 2, 5, and 7 ply, asphalt binder 1/4 to 7/16 in. thick, 4 ft. wide, 6 to 12 ft. long; corrugated lath 18x48 in., shiplapped.

FIBROFELT

Union Fibre Sales Co. Flexible board of felted flax and rye straw fiber. 5/16 and 1/2 in. thicknesses flanged for 16 and 24 in. on centers, also flat in 32 and 36 in. wide; 3/4 and 1 in. thicknesses, flat only, 32 and 36 in. wide; lengths, 8, 8 1/2, 9, 9 1/2, 10 ft.

FIR-TEX

Fir-Tex Insulating Board Co. Rigid and semi-rigid boards of Douglas fir fiber, semi-rigid boards 1/2, 1, 1 1/4, and 1 1/2 in. thick, not laminated, 4 x 4 ft., rigid building board 1/2 in. thick, 4 ft. wide, 8, 9, 10, 11 and 12 ft. long; rigid plaster base 12x18 in., 4 ft. long.

GIMCO ROCK WOOL CORK BOARD

General Insulating & Mfg. Co. Gimco Rock Wool—fiberized silica—formed into blocks; 9 x 24 inches; thicknesses of 1, 2, 3, and 4 inches. Intermediate and greater thicknesses to order.

INSO BOARD

Stewart Inso Board Corp. Wheat straw fiber felted; 7/16 in. thick, 4 ft. wide, 6 to 12 ft. long; lath 7/16 thick; 18 x 48 in., long edges shiplapped; industrial board same as standard but not used for structural purposes.

IN-CEL-WOOD

Cornell Wood Products Co. Northern soft wood fiber felted; 1/2 in. thick, 4 ft. wide, 6, 7, 8, 9, 10, and 12 ft. long; plaster base 1/2 in. thick, 18 x 48 in., edges shiplapped; roof insulation in multiples of 1/2 in. thick, 2 x 5 ft. 1 in. thickness with offset edges (shiplapped).

INSULITE

Insulite Co. Felted wood fiber; 1/2 in. thick, 48 in. wide, 8, 9, 10, or 12 ft. long; plaster base 1/2 and 1 in. thick, 18 x 48 in., shiplapped edges; roof insulation 1 in. thick, 18 x 36 in., and 2 x 5 ft. two layers of 1/2 in. board stapled together with offset edges (shiplapped), also 1/2 in. thick.

J-M INSULATING BOARD

Johns-Manville Corp. Moulded wood fiber impregnated with waterproofing agent; 1/2 or 1 in. thick, 4 ft. wide, 6, 7, 8, 9, 10 and 12 ft. long; plaster lath 1/2 or 1 in. thick, 18 x 48 in., edges shiplapped.

(Table Continued on Page 78)

There is one exception to the statement in the preceding paragraph as one of these fill materials consists of a mixture of paper and asbestos particles. These particles are blown through a mixing nozzle, where they are combined with an asphalt binding material, into the wall or other space to be insulated. The binder acts also as an adhesive to cement the material to the wall surface.

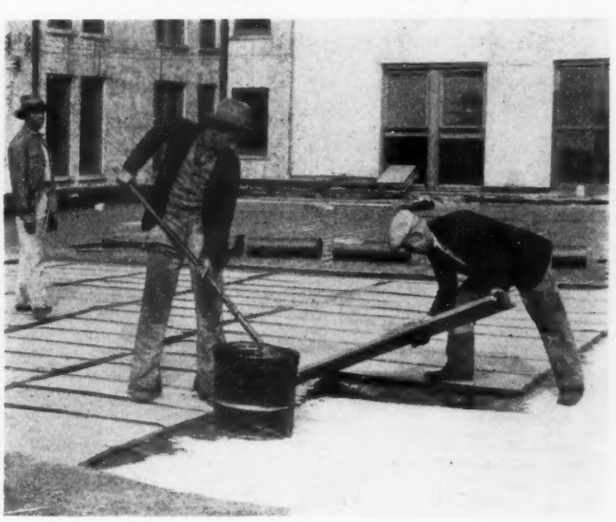
Because all of the products listed have been developed primarily for the purpose of thermal insulation, all of them, in spite of their wide variety of material and form, possess certain characteristics in common. While many of them have other characteristics, which recommend them for other purposes, these are secondary.

Due to the rapid developments in this field, there has been, and still is a certain amount of confusion and inaccuracy in the use of the term insulation. Speaking accurately there are two kinds of insulation. These are thermal insulation, and sound insulation. Acoustical treatment, which is frequently confused with insulation, is not insulation at all. The confusion arises to a large extent from the fact that many of the thermal insulating products listed in the tabulation are also used for acoustical treatment.

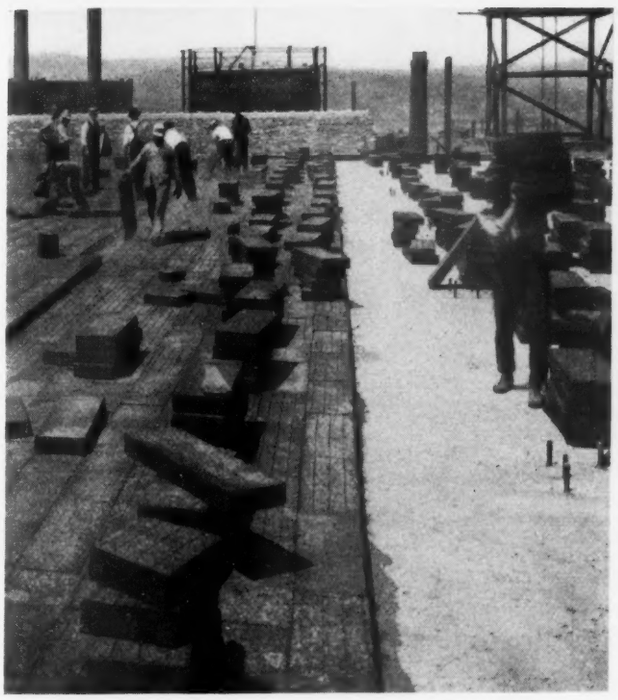
Thermal insulation is concerned with the problem of reducing the transfer of heat from one region to another as, for example, from the interior of the house to the outdoors, in cold weather. Sound insulation is concerned with the transfer of sound from one region to another as, from one room to another or from the outside to the interior of a building. Acoustical treatment is concerned with the reduction of noise due to the reverberation of sound within an enclosed space or room.

Each of these problems is separate and distinct and should be so treated in both discussion and practice. Sound insulation will be discussed in the second part of this article which will be published in the June issue of the AMERICAN BUILDER AND BUILDING AGE. Acoustical treatment, because of the overlapping use of insulation materials for the purpose, will also be discussed briefly.

Before going into the theory and practice of thermal insulation it would be well to consider what reason there is for insulation in the first place. There are two reasons for using thermal insulation, comfort and



Two Layers of Fiber Board Insulation Covered with Prepared Roofing and Gravel Assure Conservation of Heat Below.



Blocks of Corkboard Used as Roof Insulation Are Easily Handled and Are Highly Effective.

economy. In the use of insulating materials these two purposes must be considered together.

Modern living standards demand the maintenance of constant, comfortable temperatures within buildings. High costs of fuel and heating equipment point the need for economy in heating, while high building costs and interest charges point to the need of economy in construction.

A building may be kept at a comfortable temperature, provided excessive leakage is prevented, by the use of an ample heating plant and plenty of fuel. Some of the expense of a large heating plant and free use of fuel can be reduced by insulated construction which prevents a certain proportion of heat loss through walls and roof. The problem is to secure the desired comfort with the lowest annual total of interest on the building investment, interest on the heating plant, and fuel cost. This problem can be practically worked out by the use of available data.*

A fairly accurate idea of the percentage of fuel saving obtained through various types of insulation is shown in Table I (page 75), prepared by the U. S. Bureau of Standards, published in Circular No. 376, "Thermal Insulation of Buildings." In discussing this table the circular says, "whenever insulation is involved, it is assumed that the insulation is applied to both walls and roof, and that the insulation is not substituted for some other member which is present in the uninsulated construction."

Considering the fuel saving shown in this table, there can be no question of the economy of using insulation but, in addition to fuel saving, insulation makes possible other economies. One of the most important needs for insulation is in the roofs of apartment buildings, and in the roofs or attic floors of homes. It is a common thing to see the ceiling lath of an upper story outlined with dust stain. This staining is entirely due to lack of proper insulation.

The air above the upper story ceiling is colder than the air in the room below, in cold weather. This makes the plaster between the lath colder than the room temperature. The moisture in the room condenses against the cold spots on the ceiling, catches dust, and causes

*"The Cost of Comfort", published by the National Lumber Manufacturers Association, Transportation Bldg., Washington, D. C.
"American Society of Heating and Ventilating Engineers Guide—1931", published by the American Society of Heating and Ventilating Engineers, 51 Madison Ave., New York City.

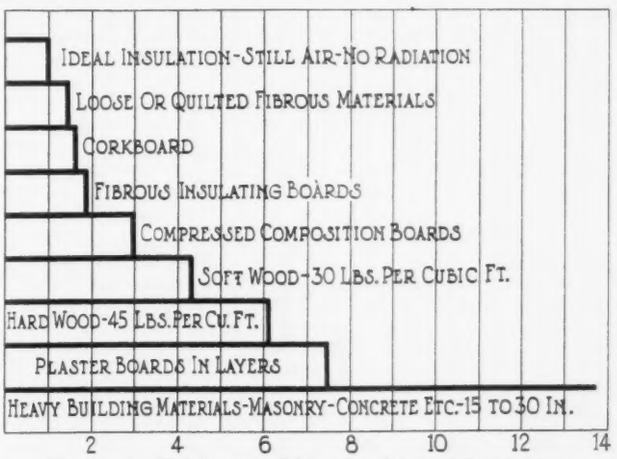


Figure 1. Thickness of Various Materials Having Equivalent Heat-Insulating Values. The Number of Inches for Each Material Shows the Thickness Required to Equal One Inch of Ideal Insulation.

Here Is an Almost Ideal Insulation Job. The Air Space Between the Studs Is Divided by Means of a Flexible Blanket Material and a Fiber Board Is Applied to the Studs as a Plaster Base.

J-M ROCK CORK

Johns-Manville Corp. Rock wool treated with waterproof binder and formed into sheets, 18x36 in.; 1½, 2, 2½, 3, and 4 in. thick; also 18x18 in. 1 in. thick, used for cold storage and other low temperature insulation.

JOINTITE CORKBOARD

L. Mundet & Son, Inc. Ground cork pressed in moulds and baked; ½, ¾, 1, 1½, 2, 3, 4, and 6 in. thick, 12 in. wide x 36 in. long.

LINOBOARD

Union Fiber Sales Co. Rock wool and flax fiberboard; 18 in. wide, 48 in. long; 1, 1½, 2, and 3 in. thick.

LITH

Union Fibre Sales Co. Water repellant board of flax fiber; 1, 1½, 2, and 3 in. thick; 18 in. wide; 48 in. long; especially for cold storage and roof insulation.

GOLD BOND MAFTEX

National Gypsum Co. Manufactured by MacAndrews & Forbes Co. Licorice roof fibers felted; 7/16 in. thick, 4 ft. wide, 8, 9, 10, and 12 ft. long; roof insulation, not for structural use, ½ in., 4 x 4 ft.; Maf-Lath 7/16 in., 16 in. wide, 48 in. long.

MAIZEWOOD

Maizewood Products Corp. Cornstalk fiber felted treated to resist moisture; 7/16 in. thick, 4 ft. wide, 8 to 12 ft. long; roof insulation ½ in. or 1 in. thick, 2 x 3 ft.; lath 18 x 48 in., edges shiplapped.

MASONITE

Masonite Corp. Wood fiber felted; not treated; 7/16 in. thick, 4 ft. wide, 8, 9, 10, or 12 ft. long; lath 2 x 4 ft. shiplapped.

MINERAL FELT

The Mineral Felt Insulating Co. Felted mineral wool formed into flexible blocks 6 x 18 in., and larger, thicknesses from ¾ to 3 in.

NOVOID CORKBOARD

Cork Import Corp. Ground cork, baked and pressed into sheets; 12 x 36 in. or 24 x 36 in. for roofs and floors, also 12 x 32 in, for nailing to studs, joists, etc.; all sizes available in 1, 1½, 2, 3, and 4 in. thick.

NU-WOOD

Wood Conversion Co. Wood fiber felted, ½ in. thick, 4 ft. wide, 6, 7, 8, 9, 10 and 12 ft. long; Nu-Wood lath ½ in. thick, 16 x 48 in., with V-joint along edges; roof insulation 24 x 47 in., ½ or 1 in. thick; Nu-wood bevel-lap tile. Various sizes for decoration and acoustical treatment.

RED TOP INSULATING BOARD

U. S. Gypsum Co. Hardwood fiber felted; ½ in. and 1 in. thick, 4 ft. wide, 8 to 12 ft. long; lath ½ in. thick, 18 x 48 in.

TEMLOK

Armstrong Cork & Insulation Co. Fabricated from the heartwood of Southern pine; ½ and 1 in. thick, 4 ft. wide, 6 to 12 ft. long; plaster lath 18 in. wide, 48 in. long, edges shiplapped; roof insulation 22 in. wide, 47 in. long.

TEN-TEST

International Fibre Board, Ltd. Northern spruce fiber felted; 4 ft. wide, up to 17 ft. long, 7/16, 5/8, ¾, and 1 in. thick; special up to 2 in. thick; waterproofed; plaster board, 16 x 47¾ in. V-notched.

THERMATEX

Housing Company. Wood fiber board, chemically treated; 2 ft. wide x 4 ft. long, 1, 2, and 3 in. thick; also wall blocks 3 in. thick, 14 in. wide (to fit between studs) up to 4 ft. long.

THERMAX

Thermax Corp. Fine wood shavings coated with fireproofing binding emulsion of refractory material and rolled into slabs; 1 in. thick, 20 x 64 in.; 2 in. thick, 20 x 64 in.; 3 in. thick, 20 x 48 in.

TORFOLEUM

Torfoleum Corp. Dried peat moss made into sheets without bituminous or mineral binder; 12 in. wide x 32 in. long, and ½ x 1 meters (approximately 19½ x 39 in.), 1 to 6 in. thicknesses.

TRIPLE INSULAIRE

Triple Insulaire Co. Corrugated board formed to the shape of a hollow I-beam, creating three 1-in. air spaces, closed every 3 ft. with header plates; 3 ft. sections, adjustably sized to fit between studs.

(Table Continued on Page 80)

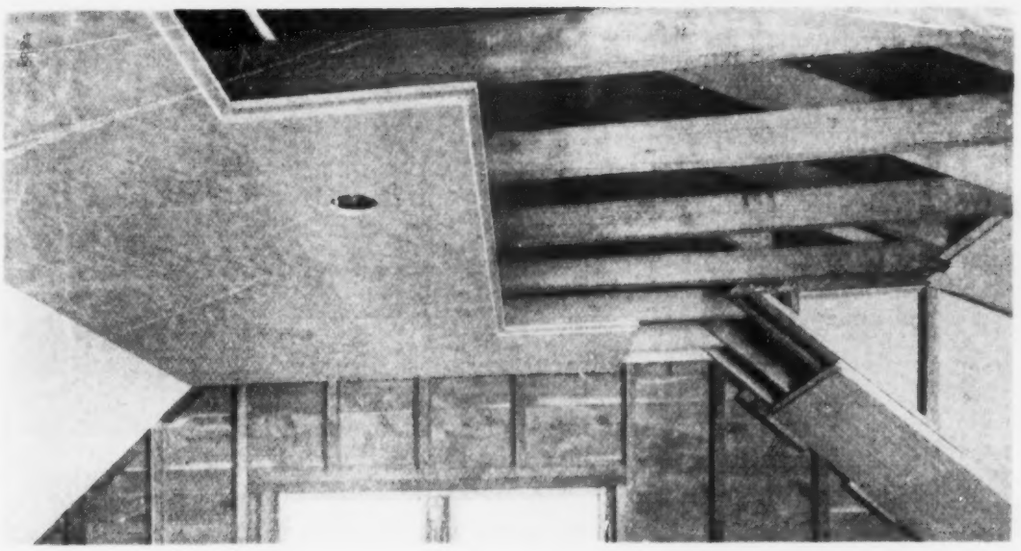
Flexible Blanket Materials Are Turned Up at the Edges and Nailed to Studs or Rafters.

the streaks of dust stain. Condensation can be eliminated by the application of roof insulation, after which redecoration will not be required as often.

In almost any house construction thermal insulation is economy and should be used *in addition to* the usual construction materials, not as a substitute for other materials. If the insulating material is added the insulating value of the wall will be increased by an amount equal to the insulating value of the material added. If it is substituted, the added insulation will be only the insulation value of the material less the insulation value of the material for which it is substituted. This matter of substitution is an important point in the problem of insulation. There has been a decided tendency to use various insulating materials, especially the fiber boards, in place of wood sheathing. While this does decrease the heat loss through walls to a certain extent, the amount is small. This practice can not be called insulation. If the insulating material is sold to the owner to replace some other material, and also on its insulating value, the owner is sure to be disappointed with the result and the whole development of the practice of insulation will be retarded by adverse owner opinion.

On the other hand, thermal insulation, merely as insulation, can be sold on the basis of actual economy and will produce satisfactory results. The time will undoubtedly come when thermal insulation will be used almost universally. It will be regarded simply as good construction and its use will be accepted as standard building practice.

With more than forty companies manufacturing more than fifty thermal insulating materials, the selection of any one material for use is a rather complicated problem to the practical man in the field who has little opportunity to investigate each product individually. The problem is somewhat simplified by the question of availability. Naturally the products which are best known to the builders will be the line which the building material dealers will carry in stock, and such will be most convenient to use.



Many Manufacturers Are Now Offering Insulation in a Form Called Lath, as a Plaster Base. The Lath Comes in Small, Easily Handled Sizes, with Shiplapped Edges to Produce a Smooth Wall Surface.

The problem then narrows itself to a choice between types; boards, blankets, and fills; and between individual brands. Each of the types possesses certain characteristics which recommend it. Ease, and hence economy, of application is the outstanding advantage of the boards and a strong point in their favor when labor represents such a large proportion of building costs.

The fact that the blanket materials can be placed between studs, dividing the air space and so affording increased insulating value from the air space, is an important point in their favor. They are also applied over the studs or joists, in the same way as the boards, which reduces the cost of application though, at the same time, it reduces the insulating effect. They are difficult, if not impossible to apply in existing houses, except between rafters or attic joists.

The fill materials are easy to apply as they are merely poured or blown into the wall, floor or roof spaces, between studs, joists and rafters. They can be applied to existing buildings by opening the walls, or between attic joists. They require a retaining construction under rafters for roof insulation.

Regardless of what type or brand of insulation may be preferred, however, some kind of insulation should always be used. When it comes to trimming down the cost of a proposed house to meet the budget, insulation is usually one of the first items to be cut when actually it should be the last. Right here the builder can do his client a real favor by pointing out the definite economy of insulation, as shown in Table I, and urging that this item shall not be omitted.

There is considerable confusion and uncertainty as to the relative effectiveness of the various types and brands of materials, due perhaps to the technical nature of statements on the subject. It is actually far simpler than is generally supposed. The whole thing turns on an understanding of thermal conductivity.

Figure 1 (page 77), taken from the U. S. Bureau of Standards Circular "Thermal Insulation of Buildings", shows the actual comparative value of various materials.

A thermal insulating material is essentially a material having a large percentage of relatively small voids containing air. It is this contained air which gives the insulating value. The greater the density of any material the less air it contains and the less its insulating value.

"Investigation has shown," according to the Bureau of Standards Circular No. 376, "that the differences in the respective thermal conductivities of the various light fibrous or cellular materials are not great. Of such insulators less than 1½ inches of the poorest material is equivalent in insulating value to 1 inch of the best."

The most important question, therefore, in selecting an insulating material, so far as its insulating value is concerned, is the question of its thickness, rather than the material, provided the material is one of the fibrous or cellular materials. The advantage of thicker insulation is definitely indicated by the greater percentage of fuel saving from one inch of insulation than from ½ inch, as shown in Table I. No material in a very thin layer can be expected to provide an appreciable amount of insulation.

In this connection it is interesting to note that the manufacturers of insulating materials are rapidly

Mineral and Rock Wools Can Be Handled in This Way and Stuffed into Every Crack and Corner.

recognizing the importance of thickness. Nearly all of these materials were made formerly, in ½-inch thicknesses only. Now many of these companies are offering the same materials in greater thicknesses. There seems to be a tendency to make one inch the standard thickness, though a number of materials are available in even greater thicknesses.

A considerable insulating value can be obtained from the air space enclosed within a wall. According to the Bureau of Standards circular: "If a layer of material is placed in the middle of an air space, such as that between the studs in a frame wall, greater additional insulating value is obtained than if the material is placed in contact with the sheathing, or as a plaster base, as is assumed in Table I. In the former case the insulating layer not only furnishes its own insulating value, but, in addition, divides the air space into two parts, each of which has about the same insulating value as the original air space. The addition of a ½-inch layer of insulation in the middle

Gypsum Dry Fill Materials Are Poured Into the Wall Spaces or Between Floor Joists Filling the Entire Space.

Flexible Blanket Materials

BALSAM-WOOL

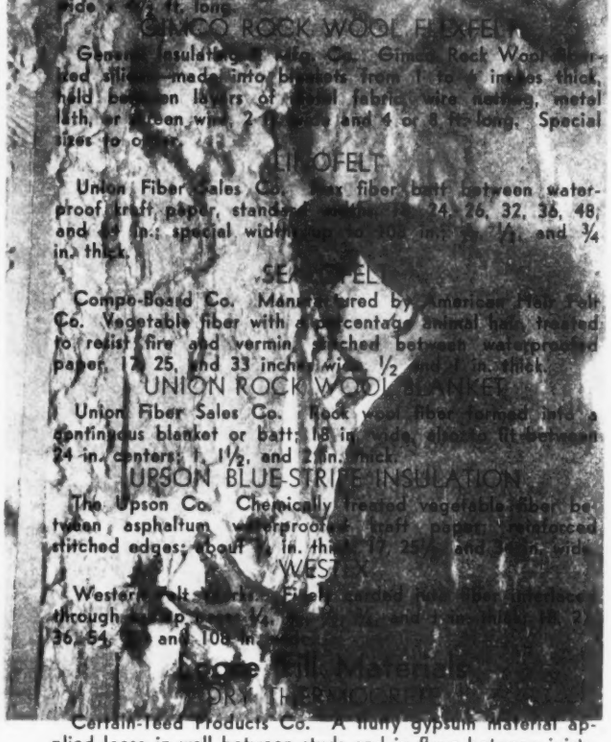
Wood Conversion Co. Wood fiber treated to resist fire and matted between asphalt coated, creped, kraft paper. ½ in. or 1 in. thick; 17, 25, and 33 in. wide.

CABOT'S QUILT

Samuel Cabot, Inc. Eel grass (zostera marina) stitched between sheets of kraft paper; single-ply ⅓ in. thick; double-ply ½ in. thick; triple-ply ⅔ in. thick; also 1 in. thick; 36 in. and 18 in. wide.

FLAX-LI-NUM

Flax-li-num Insulating Co. Flax fiber felted into semi-rigid sheets, ½ in. thick, 16½ in. wide, 8, 9 & 10 ft. long. Flanged on each side to fit between studs; also flat sheets 4 x 4½ or 8 ft.; ¾ in. and 1 in. thick flat sheets, 4 ft. wide x 4½ ft. long.



GIMCO ROCK WOOL FILL-O-FELT

General Insulating & Mfg. Co. Gimco Rock Wool fiberized silica made into blankets from 1 to 4 inches thick, held between layers of wood fabric, wire netting, metal lath, or screen wire. 2 ft. wide and 4 or 8 ft. long. Special sizes to order.

UNION FIBER FELT

Union Fiber Sales Co. Flax fiber batt between waterproof kraft paper, standard widths 24, 26, 32, 36, 48, and 64 in.; special widths up to 108 in. ½, ⅝, and ¾ in. thick.

SEAL-O-FELT

Compo-Board Co. Manufactured by American Felt & Filler Co. Vegetable fiber with a certain percentage animal hair, treated to resist fire and vermin, stitched between waterproofed paper. 17, 25, and 33 inches wide. ½ and ¾ in. thick.

UNION ROCK WOOL BLANKET

Union Fiber Sales Co. Rock wool fiber formed into a continuous blanket or batt; 18 in. wide, spaced to fit between 24 in. centers; 1, 1½, and 2 in. thick.

UPSON BLUE-STRIPE INSULATION

The Upson Co. Chemically treated vegetable fiber between asphaltum waterproofed kraft paper; reinforced stitched edges; about ¼ in. thick; 17, 25, and 33 in. wide.

WESTEX

Western Felt Works. Felted fibre insulation through [illegible] 36, 54, 72 and 108 in. wide.

Loose Fill Materials

CERTAIN-TEED THERMOFILL

Certain-Teed Products Co. A fluffy gypsum material applied loose in wall between studs and in floor between joists.

EAGLE MINERAL WOOL

Eagle-Picher Lead Co. Mineral wool made from flint rock, limestone and other minerals; blown into air spaces between walls, floors and ceilings; applied loose between rafters.

GIMCO ROCK WOOL

General Insulating & Mfg. Co. Fiberized free silica, used as a roof, wall and floor fill.

GOLD BOND DRY FILL

National Gypsum Co. Chiefly gypsum, ground fine and used dry. Poured loose between rafters, studs, and joists.

GYPSOLITE

Universal Gypsum & Lime Co. Specially processed dry gypsum applied loose in rafter, stud and joist spaces.

INSULEX

Universal Gypsum & Lime Co. A prepared gypsum product; when mixed with water and poured as a fill into wall, roof and floor spaces produces a sponge-like, cellular insulation; also made in precast form.

J-M HOME INSULATION

Johns-Manville Corp. Rock wool made from pure silicdous limestone; blown into walls, roofs.

MINERAL WOOL

United States Mineral Wool Co. Mineral wool from slag converted to fibrous state; applied in walls, roofs and floors; made in two grades, Ordinary and Selected. The latter used in chemical plants but rarely in buildings.

PYROCOAT

The Mineral Felt Insulating Co. Woolly rock fibers of tubular form containing air cells within the fibers, treated to make firm and proof against settling; applied dry in floor, wall and roof spaces.

ROCK WOOL

Union Fibre Sales Co. Rock wool, supplied in three grades, unoiled, light oiled, and medium oiled. Used in walls, roofs, and floors.

SPRAYO-FLAKE

Sprayo-Flake Co. Paper and asbestos particles sprayed in conjunction with a chemically treated emulsified asphalt binder. Applied in walls, roofs, and floors in any thickness desired.

THERMOFILL

U. S. Gypsum Co. Flaky, gypsum base material, poured loose between attic floor joists, studs, etc.

THERM-O-PROOF

Therm-O-Proof Insulation Co. Lead slag, mineral wool, blown into walls, floors, roofs.

UNITED'S GRANULATED CORK

United Cork Companies. New cork ground and screened to various sizes, ⅛ to ⅝ in. mixed; used as loose fill.

UNITED'S REGRANULATED CORK

United Cork Companies. Scrap of corkboard reground; screened ⅛ to ⅝ mixed; used as loose fill.

UNITED'S CORKBOARD

United Cork Companies. Granulated Cork, compressed into boards and baked; 12 x 36 in.; 12 x 32 in. to fit against studding, 1, 1½, 2, 3, and 4 in. thick.

of the air space in a frame wall is therefore the equivalent of adding a little more than ¾-inch at some other place in the wall. . . .

"For air spaces more than about three-fourths of an inch wide the insulating value is practically constant, independent of width. Narrow spaces have less insulating value, and below about one-half inch the insulating value is approximately proportional to width. . . .

"The air space formed by the use of furring strips under plaster or stucco is nearly as effective as a wider air space, but narrower air spaces than this are less effective."

In applying insulation it is a common error to take into consideration only the walls of the building and the weatherstripping of windows. The American Society of Heating and Ventilating Engineers Guide, for 1931, particularly calls attention to this mistake as follows:

"Heat is lost from a building by transmission through all those surfaces which separate heated spaces from the outside air or from unheated colder spaces within the building. In general, five kinds of surfaces are involved: (1) outside walls; (2) outside glass; (3) inside walls or partitions next to unheated spaces; (4) ceilings of upper floors, either below a cold attic space or as the underside of a roof slab, and (5) floors of heated rooms above an unheated space. In most cases, only items (1) and (2), outside wall and glass surface, are considered. Failure to take account of the other heat losing surfaces, items (3), (4), and (5), when they exist in a building, has generally resulted in more or less dissatisfaction with the operation of the heating plant, as a result of failure to heat the rooms having such surfaces as indicated by items (3), (4), and (5)."

The same insulation which means fuel economy in winter, affords a high degree of comfort in hot summer weather. The thoroughly insulated house, with ventilation properly managed, is comfortable at all times. In the insulated house, all windows are opened wide at night to admit the cool air. As the outside temperature rises during the day, the windows are closed, especially on the side toward the sun, and the cool air is retained within the insulated house, just as the cool air is retained within a refrigerator.

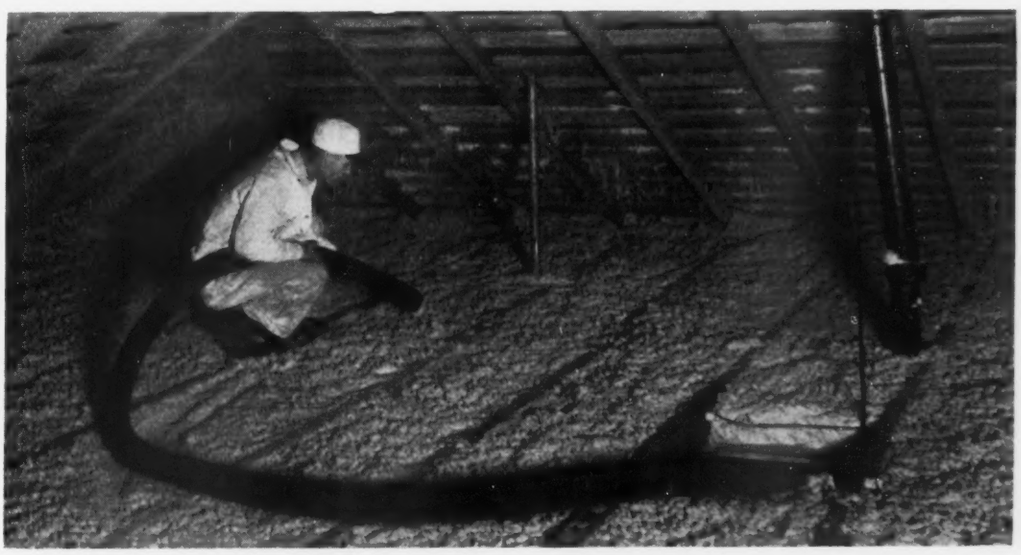
In insulating to exclude heat, the insulation of the roof is, proportionately, more effective than the insulation of walls, because of the fact that roofs have

Rock Wool Can Be Blown Into the Walls of Even an Old House by Removing a Few Strips of Siding. An air compressor furnishes power.

greater exposure to the sun than do walls. Both roof and wall insulation are, however, important and will pay well on the investment.

According to the Bureau of Standards data, in roof insulation, if a building has an unused attic or air space, the insulation is best applied either on or between the ceiling joists of the top story. Of recent years, however, there has been a strong tendency to finish formerly unused attics and utilize this space instead of wasting it. Under such circumstances, of course, the insulation should be applied to the roof itself.

The Second Installment of this important subject will be presented in the June issue—Editor



The Cost of Applying Insulation Is Reduced by Methods Like This where Mineral Wool Is Blown from the Ground Equipment, Through a Hose Into the Spaces Between the Attic Floor Joists.

Retaining the Natural Beauty of Su

The Building Has Been Carried Up in Height and Adequate Space Retained Around It

75 PROSPECT ST.

EAST ORANGE

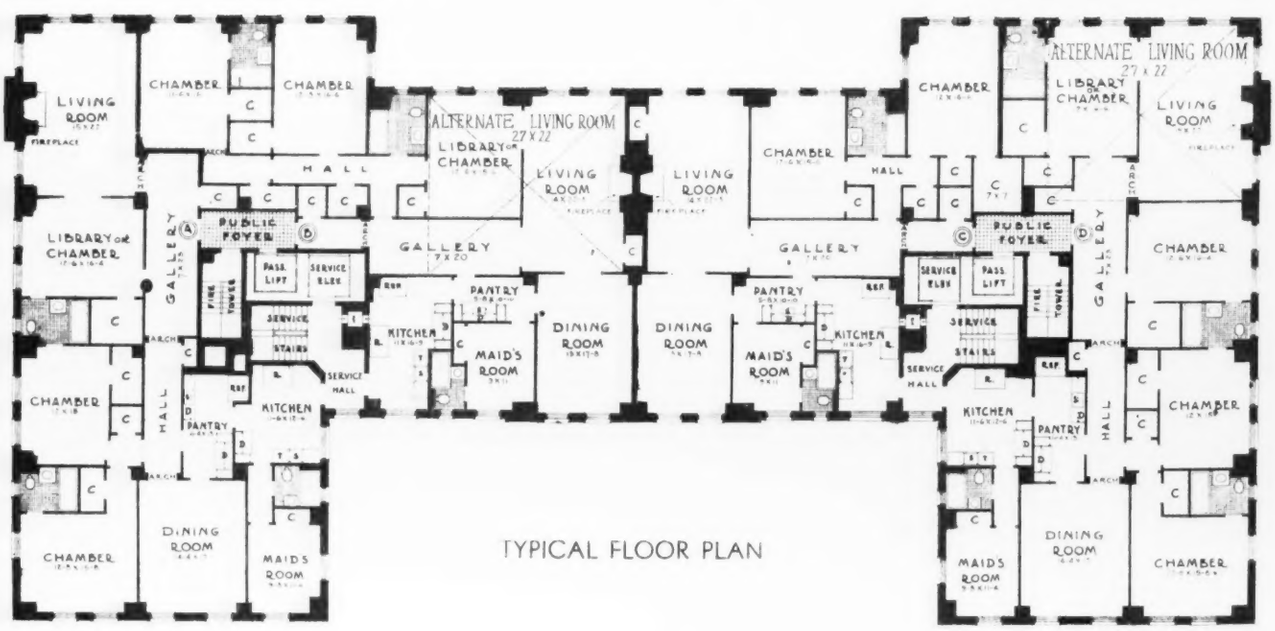
New Jersey

(Co-operative Ownership)

SALMOND, SCRIMSHAW & COMPANY
Builders

JOHN B. PETERKIN
Architect

The masses of brick work have been simply and attractively handled and the individual apartments well planned and arranged. There are four residences on each of the ten stories, ranging in size from five rooms and two baths to fifteen rooms and seven baths.

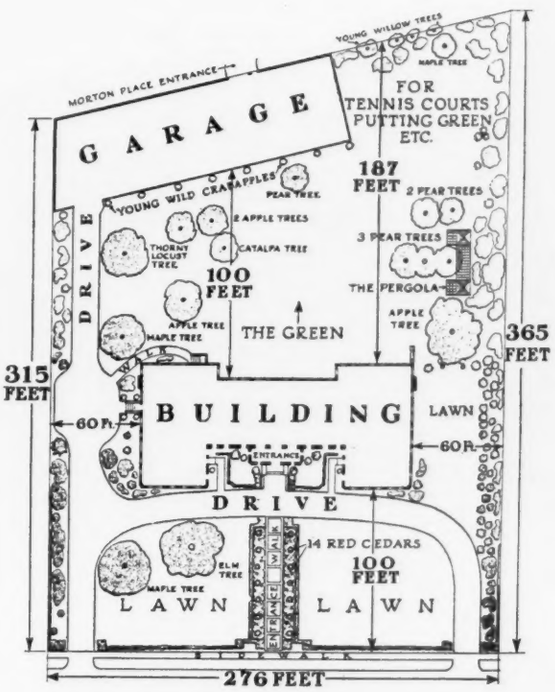


TYPICAL FLOOR PLAN

# of Suburban Land

The Value of This Suburban Site Has Been Utilized, Not Destroyed

The plot on which the apartment stands contains over 2½ acres. The building occupies only 10 per cent of the land. The rest is trees, lawns, shrubbery, pergola and walks. A large garage is located at the rear of the property.



BLOCK PLAN

DESCRIPTIVE DATA

Date of Completion: April 1st, 1929
Construction: Building is supported on 442 reinforced concrete piles driven to hard pan and has a structural steel frame with masonry walls. Fireproof floor construction and fireproof partitions.
Cost of Construction: $.75 per cu. ft.
Total Number of Apartments: 40
Total Number of Apartments per floor: 4
No. of rooms per apartment: 6 to 8
Total number of rooms: 280 rooms plus 40 galleries and 120 baths
Apportionment of Apartments throughout building: 10—6's; 20—7's; 10—8's
Average area of Living Room: 352 sq. ft.
Average area of Dining Room: 238 sq. ft.
Average area of Chambers: 168 sq. ft.
Average area of Kitchen (including Butler's Pantry): 200 sq. ft. to 230 sq. ft.
Average area of Gallery: 140 sq. ft.
Average closet area per apartment: 114 sq. ft.
Total no. of stories: 10
Area of stories: 10,000 sq. ft.
Elevators: 4—Otis Self-Operating Micro drive
Ground Coverage: lot—100,000 sq. ft.—2½ acres
Building—10,000 sq. ft.
Garage—7,000 sq. ft.—2 stories—90 cars
Ceiling height in apartment building: 9' 6" under beams
Large Laundry in Basement contains: 32 gas clothes dryers, 12 sets porcelain tubs, 12 gas stoves, 12 ironing boards.
Building heated by 2 Kewanee, return tube, boilers. Fired by Ray oil burners.
Kitchens and pantries are provided with attractive inlaid linoleum floor coverings, laid out in patterns, and with built-in dressers, and gas ranges. Pantries provided with ample dressers, sink with drainboard, and automatic electric refrigerators, (Frigidaire Model D-7-2).
Bathrooms have tile floors and wainscots with built-in metal medicine cabinets and fixtures.
In the living rooms, wood burning fireplaces are provided.
Shades, and full-length, copper wire screens are provided for all windows.
Self-operating, Otis elevators of the latest design have been installed in the buildings, two for passengers and two for service.
Incinerators conveniently located for all residences in the building.
Brass pipe used for hot and cold water systems; all other piping wrought iron.
Each apartment contains an abundance of large, roomy closets, equipped with shelves, clothes poles, hook strips and hooks. The linen closets have five shelves.
An individual storage compartment for each apartment with lock and key is provided for in the basement.

THE GARAGE

THE MAIN LOBBY

EXCELLENT DESIGN AND A

"It has been unnecessary to encumber the facade with extraneous ornament which so frequently mars apartment house design."

ABBOTT COURT APARTMENTS

RADBURN

New Jersey

CITY HOUSING CORPORATION

Builders

ANDREW THOMAS

Architect

Honorable mention, Apartment House Medal competition of 1930, New York Chapter of American Institute of Architects.

DESCRIPTIVE DATA AND INTERIOR FEATURES

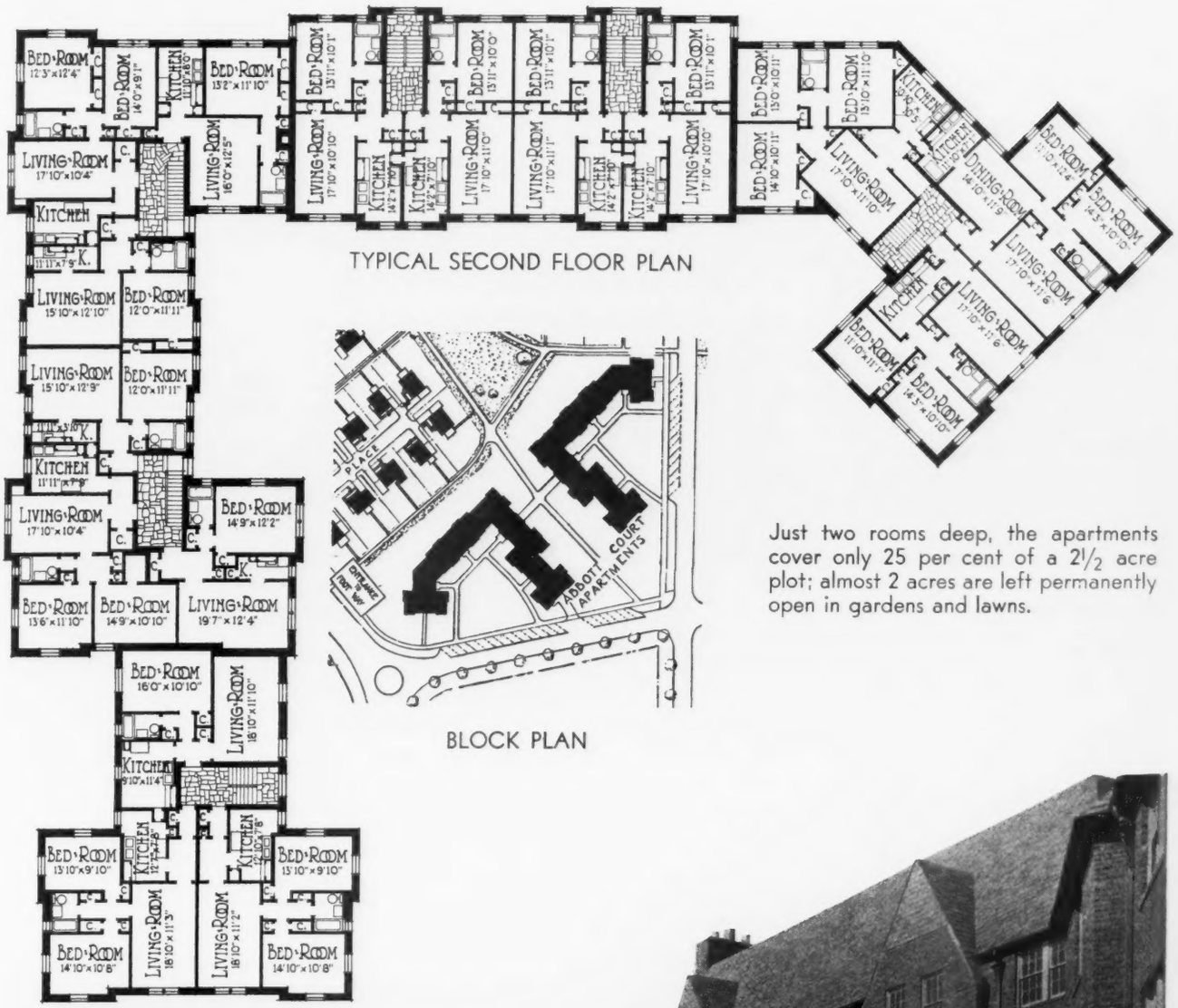
Name of Apartment: Abbott Court
Location: Abbott Road, High St. and Howard Ave., Radburn, N. J.
Completed: Oct. 1, 1929
Cost of Construction (per cu. ft.): 46.6 cents
Total number of apartments: 93
Number of rooms per apartment: 1½*, 2½*, 3, 4, and 5 rooms
Total number of rooms: 327
Apportionment of apartments throughout building:

2—1½'s	2%
14—2½'s	15%
34—3's	37%
28—4's	30%
15—5's	16%

Average area of living rooms: 209 sq. ft.
Average area of dining rooms: 180 sq. ft.
Average area of chambers: 160 sq. ft.
Average area of kitchens: 110 sq. ft.
Total number of stores: none
Elevators: none
Ground coverage: 27,040 square feet—or about 26%
Average area per room of building area: 256 sq. ft. (Bldg. area 83,760 sq. ft.)
Average area per room of lot area: 312½ sq. ft. (Lot area 102,192 sq. ft.)
Height of ceilings: 8 ft. 6 inches

(*Half room is kitchenette)

AN OPEN PLAN



TYPICAL SECOND FLOOR PLAN

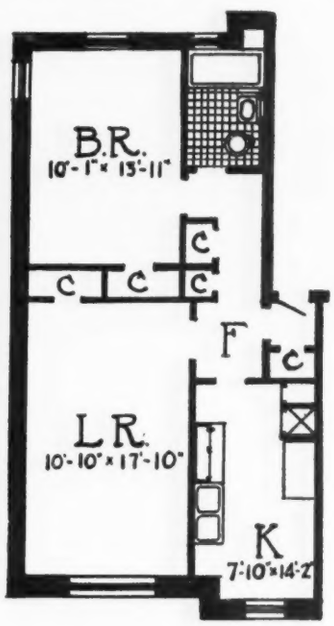
BLOCK PLAN

Just two rooms deep, the apartments cover only 25 per cent of a 2½ acre plot; almost 2 acres are left permanently open in gardens and lawns.

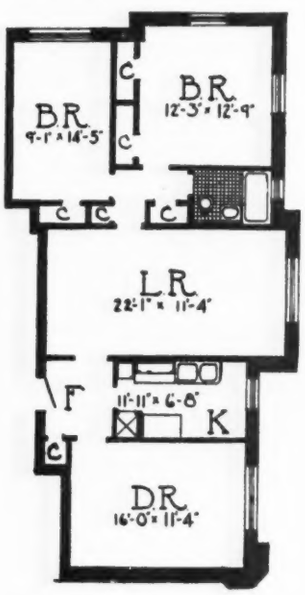
ABBOTT COURT APARTMENTS

TYPICAL FLOOR PLANS AND SPECIFICATIONS

THREE ROOMS AND BATH



FIVE ROOMS AND BATH



GENERAL OUTLINE SPECIFICATIONS

ABBOTT COURT APARTMENTS, RADBURN, NEW JERSEY

FOUNDATIONS: Footings poured concrete. 16" foundation walls, poured concrete.

FRAMING: Structural steel wall bearing, and floor framing Douglas fir 3x10, 16" on center.

EXTERIOR WALLS: 12" solid brick with Sayre & Fisher face brick. Stair halls are faced same as exterior walls.

ROOFING: All sloping roofs variegated Vermont Slate. Flat roofs, slate laid in mastic.

LEADERS, GUTTERS AND FLASHINGS: All of 16 oz. solid cold-rolled copper for all exposed work.

FLOORING: Double floors. Oak, 7/8" tongue and groove, "Minwax" finish, over North Carolina pine under-flooring. Waterproof building paper used between oak and pine floor on first floor.

INTERIOR FINISH: All walls and ceilings three coats plaster on spruce lath. Metal lath and cement plaster backing for all tile wainscots. Metal door frames and trim for all interior openings.

PLUMBING: Brass piping for all hot and cold water lines. Circulating system used for hot water.

HEATING: Coal burning boiler, steam heat with vacuum system.

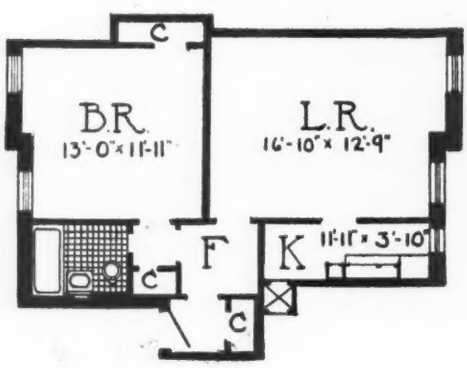
CLOSETS: Ample closet space provided. Cedar-lined closet in master bedroom.

KITCHENS: Hoosier cabinets, including dish cabinets, bread drawer, silver drawer and Kelvinator unit built into cabinet. Combination sink and wash tray. "Quality" gas range.

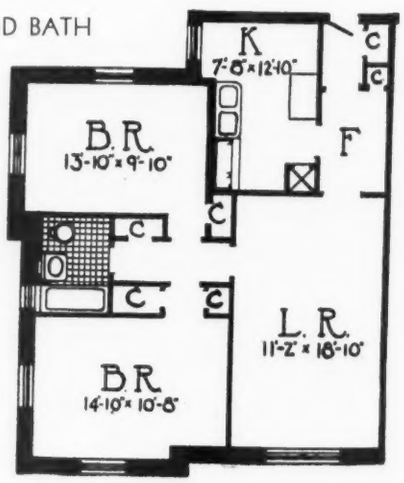
BATH ROOM: Ceramic tile floors. Black sanitary tile base, white tile walls 4' 6" high with black sanitary cap and border all of American made tile. Built-in "Balmer" black porcelain fixtures, including soap dish, tumbler and tooth brush holder, towel bars, paper holder and shower grab. "Standard" fixtures including "Pembroke" tub and built-in shower, pedestal basin, new types, silent, non-flooding, one-piece toilet with white "Church" seat, equipped with heavy "Standard" fittings and faucets in Chrome finish. Large size medicine cabinet with heavy, plate glass, etched mirror, bordered with narrow Chrome metal frame.

ELECTRIC FIXTURES: All fixtures of Colonial design in pewter and brass, or antique steel finish. Ample electric light and convenience wall outlets in all rooms. Bakelite switch and outlet plates. All wiring of General Electric materials and specifications, approved and certified by National Board of Fire Underwriters.

TWO ROOMS, KITCHENETTE AND BATH



FOUR ROOMS AND BATH



The House of the Month

Rugged Design in Stone and Stucco Selected as Best Current Example of Large Six-Room Home

"LARGE rooms but few of them," just about describes the ideal home as cherished in the plans and hopes of a good many folks of the present day. Large families are seldom encountered and it is no longer considered necessary to provide a guest room or "spare bed room" as was the custom back in the horse and buggy days. So it has come about that often the house of today, though of fairly large size, has comparatively few rooms in it.

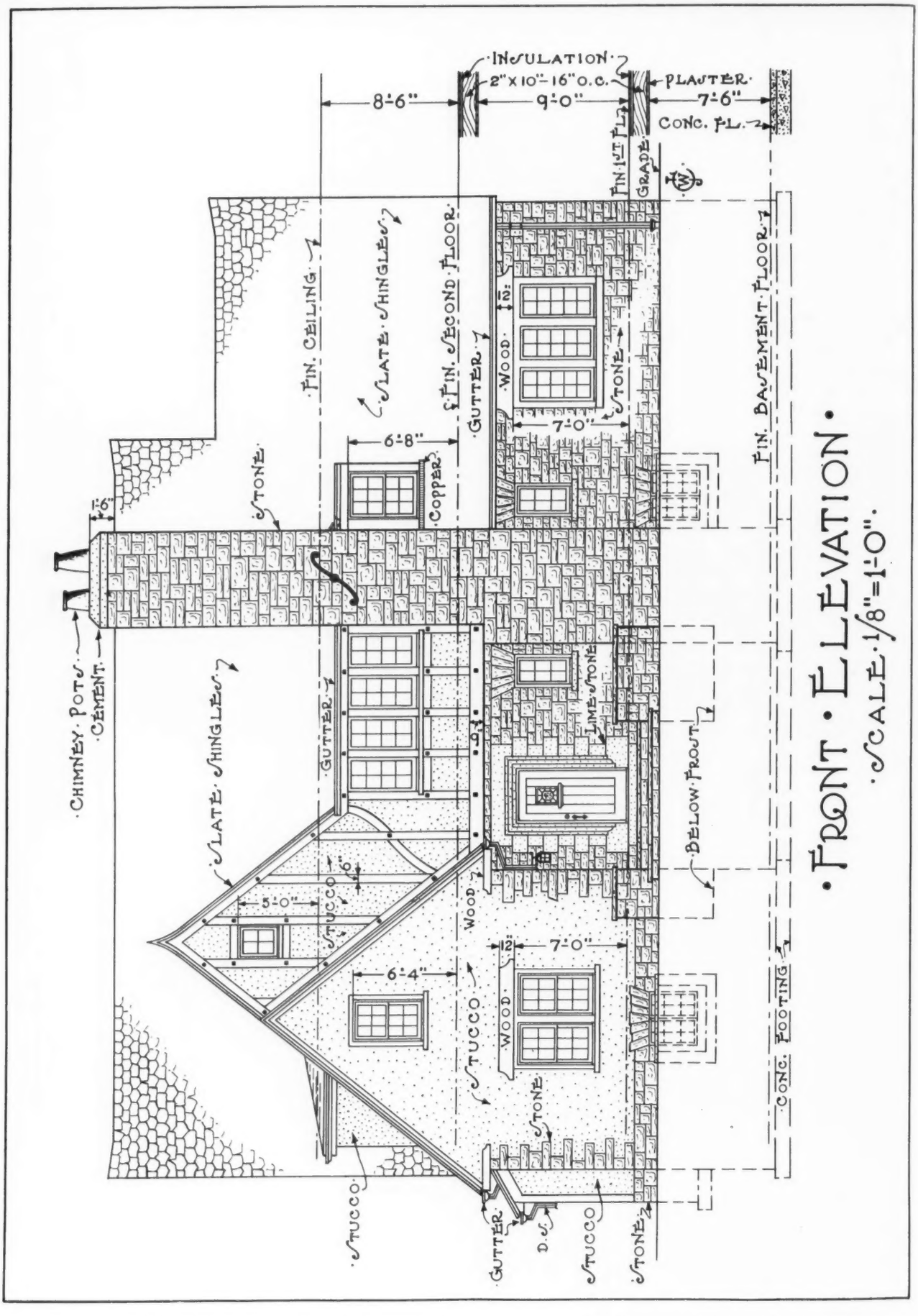
The design selected as the House of the Month for this issue is of that sort. A stone and stucco home of decided English type, this building measuring sixty feet across the front by forty feet in depth contains three main rooms on the first floor, in addition to the big solarium, entrance and stair hall, breakfast nook and lavatory. The second floor has three large bed rooms, a dressing room, two baths and an abundance of closets, while in the basement there is a well-finished hall and game room, besides the regular basement mechanical departments.

Notice how the basement rooms are lighted and ventilated with short, broad windows set in concreted area-ways. By this means, the house is kept low to the ground and at the same time, the big cellar excavated space is redeemed and made valuable for many uses.

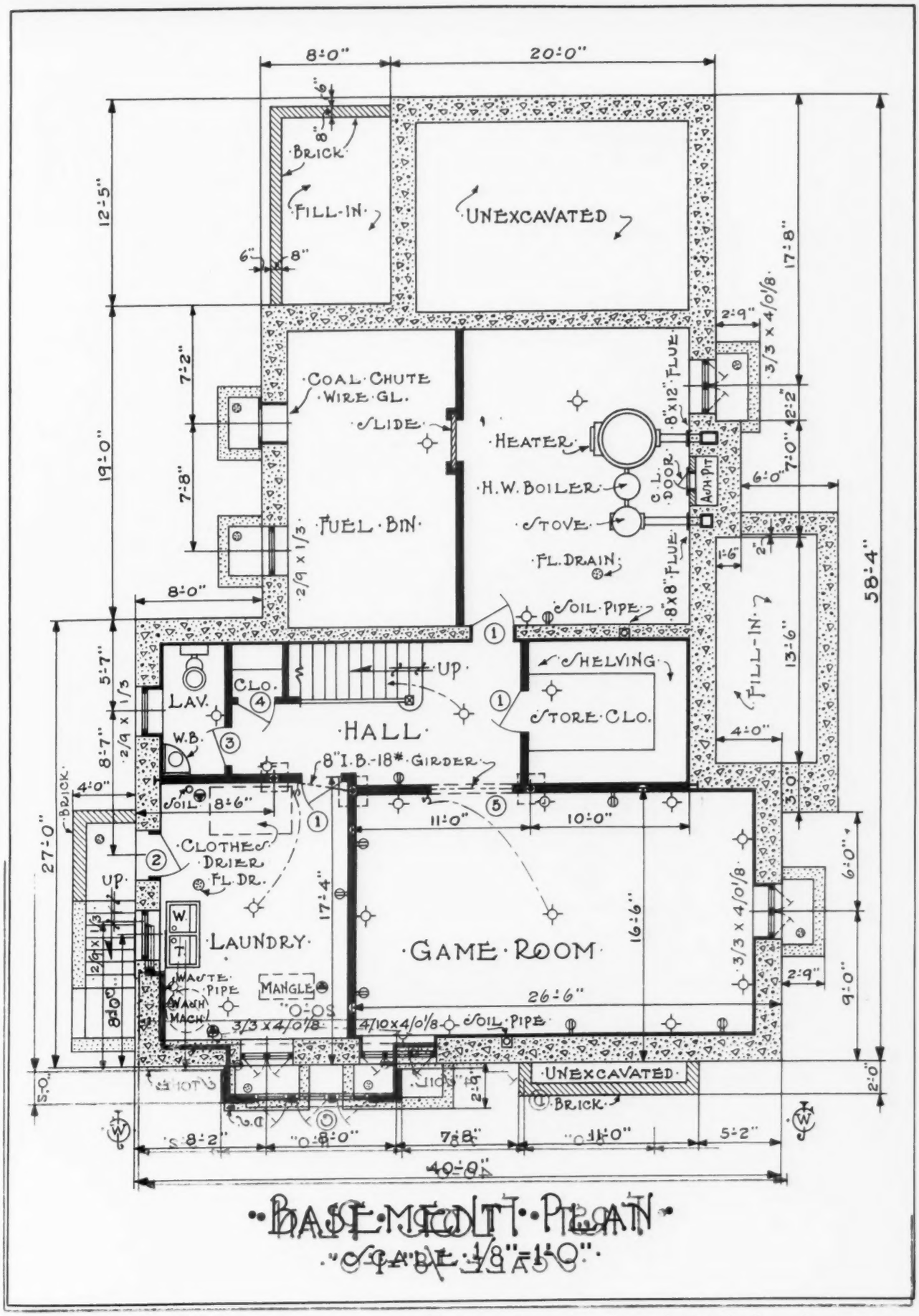
Frequently builders make the serious mistake of carrying up the basement walls too high; and a stilted appearance results. Otherwise good designs have been ruined from the standpoint of good looks by elevating the first floor enough to get large basement windows above grade.

Well lighted basement rooms are, of course, desirable; but the daylight can just as well be brought in through wide windows set in areaways. A first floor level one or two steps above ground is considered ample, and a house so placed seems to blend in with its setting in a much more graceful and natural way.

All in all, this is a very commendable design, both within and without; and we present it confidently because of the value which architects and builders, students of plan reading and of drafting will find in the study of its features.



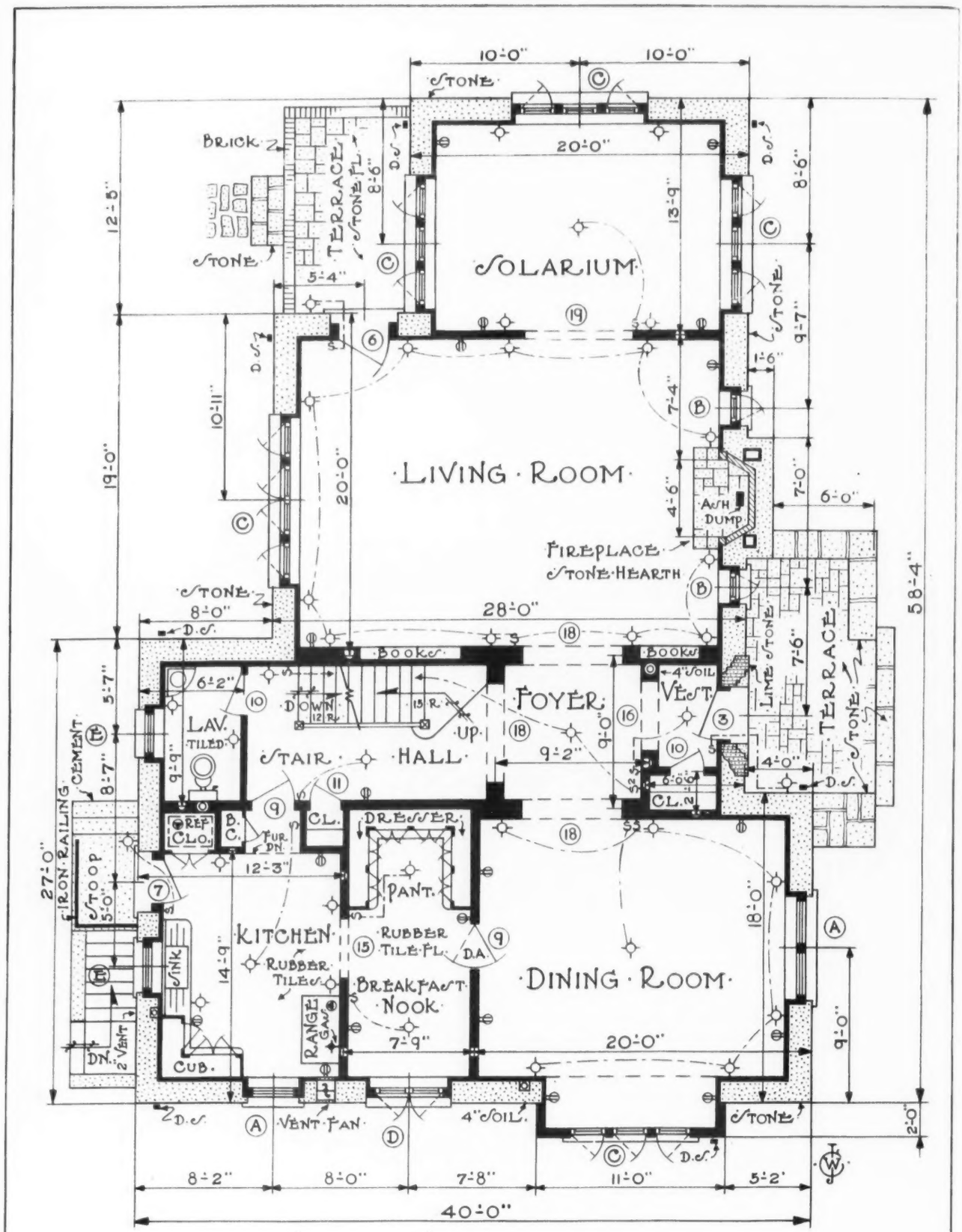
This Design Makes Harmonious Use of Stone and Stucco with Slate Roof. The Gable Panelling and the Casement Windows Give an Old-World Effect.



BASEMENT PLAN

SCALE 1/8"=1'-0"

The Basement Is Modern to the Last Degree, with Game Room, Laundry, with Outside Door, Lavatory, Finished Hall, and Cold Cellar. Besides the Fully Partitioned-off Heating Plant.



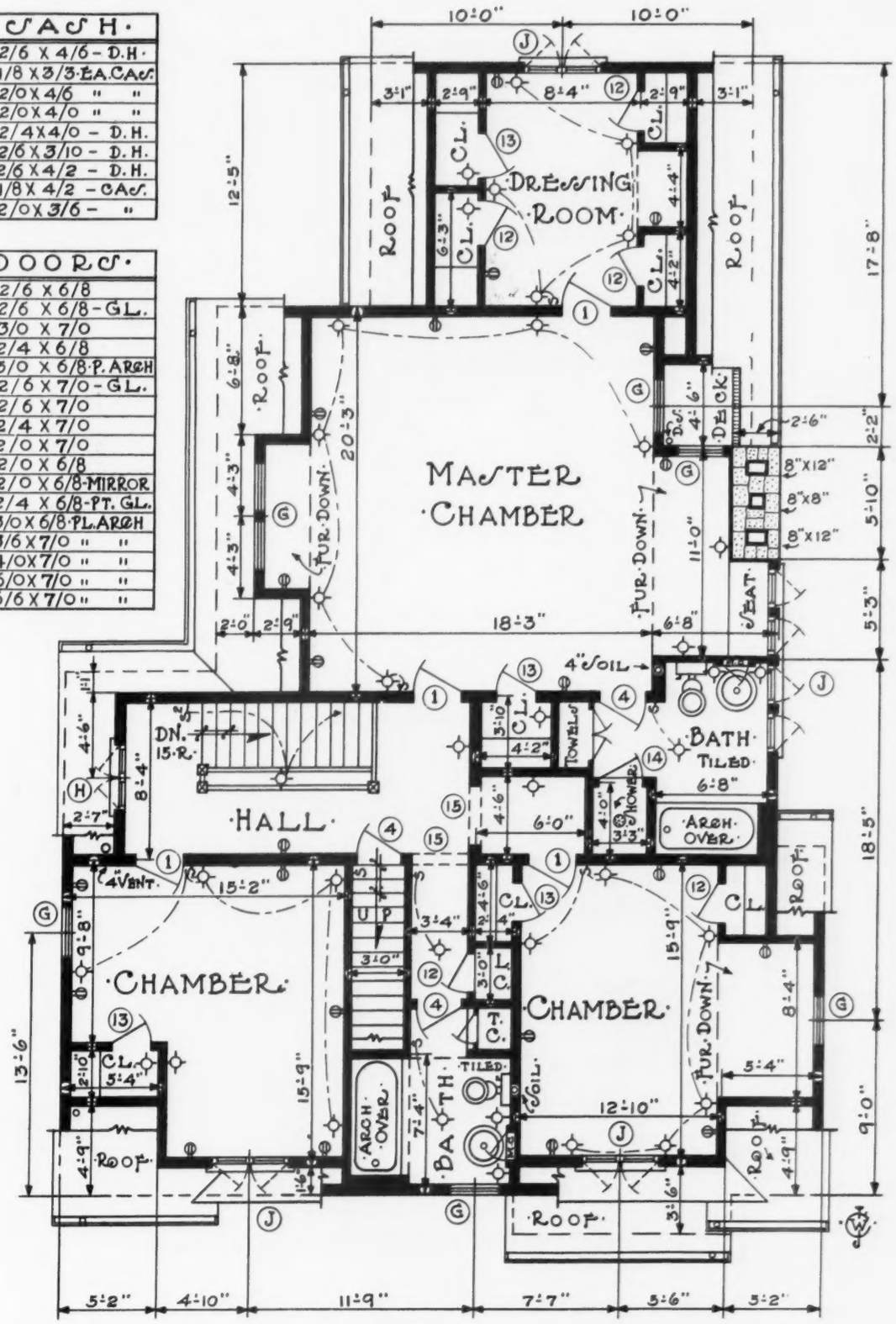
· FIRST · FLOOR · PLAN ·

· SCALE · 1/8" = 1'-0" ·

The Rooms in This May "House of the Month" Are Exceptionally Large and Attractive, Extra-Well Lighted and Conveniently Arranged. Numerous Special Features Invite Attention.

SASH	
A	2/6 X 4/6 - D.H.
B	1/8 X 3/3 EA. CAS.
C	2/0 X 4/6 " "
D	2/0 X 4/0 " "
E	2/4 X 4/0 - D.H.
F	2/6 X 3/10 - D.H.
G	2/6 X 4/2 - D.H.
H	1/8 X 4/2 - CAS.
J	2/0 X 3/6 - "

DOORS	
1	2/6 X 6/8
2	2/6 X 6/8 - GL.
3	3/0 X 7/0
4	2/4 X 6/8
5	5/0 X 6/8 P. ARCH
7	2/6 X 7/0 - GL.
9	2/6 X 7/0
10	2/4 X 7/0
11	2/0 X 7/0
12	2/0 X 6/8
13	2/0 X 6/8 MIRROR
14	2/4 X 6/8 PT. GL.
15	3/0 X 6/8 PL. ARCH
16	3/6 X 7/0 " "
17	4/0 X 7/0 " "
18	6/0 X 7/0 " "
19	6/6 X 7/0 " "



SECOND FLOOR PLAN

SCALE 1/8"=1'-0"

Three Large Bed Rooms, Two Bath Rooms and an Ample Dressing Room Adjacent to the "Master Chamber", Together with Eleven Clothes Closets Comprise the Second Floor of the House of the Month.

The Popular Basement Center of Home Fun!

The secret of success in modernizing a basement is to make it dry, clean and well lighted, watertight concrete and cellar drains below and steel ceiling and electric lights above assure a healthful room that can be furnished and used with satisfaction.

Making the Home Livable, Lovable, and Salable

BY NORVAL O. HEXAMER*

"WE just love our new home!" Why do we so often hear that remark from a friend or acquaintance who has purchased a new home? What is there about the new home that makes it so much more to be desired than the one just left? Is it the new neighborhood or environment; is it the exterior appearance or is it just the newness which makes the appeal? There is something rather alluring about the smell of fresh paint and varnish and new wood and the very cleanness of the place, but this all wears off in a short time and more than this is required to hold our affection.

There is also some interest and appeal in the exterior appearance for the builders of today have spent a lot of time and thought in dressing up the old square house with dormers, gables and long sweeping cornices, until they have developed a very attractive type of architecture without having sacrificed any of the interior arrangement which has proven so practical. But it takes more than the exterior appearance to make us love the new home. You may not have taken time to consider or analyze this question but to you as a builder it is of vital importance.

We are perhaps safe in assuming that the real reason must lie in something which has taken place under the roof. Something that has made the home more livable and it is probably not any one thing but rather a combination of the many little improvements which architects and builders have developed and added year after year.

A home becomes lovable as it becomes livable and so we no longer have the old unused front parlor with its musty odor and stiff uncomfortable furniture nor do we have the old attic with its store of broken furniture, pictures, and countless other articles and heirlooms. Nowadays we want to use the entire house for more practical purposes and the attic has been made over into a third floor sleeping or play room; and what a comfortable place it has become! In other spaces and corners we have put cupboards, shelves and storage cabinets, clothes chutes, built-in ironing boards and whatnot, and all for just one purpose—to make the home more livable.

Year after year we have watched the changes and additions until it seems that we must soon have reached perfection but we are not yet done. This is the process of evolution and it continues day by day. Science is constantly bringing us changes and improvements and with the many new labor saving devices and household appliances we are rapidly approaching the time when every part of the home will be livable, useful, and attractive.

Basement Opportunities

The old parlor has been eliminated, the attic has been claimed for a more useful purpose and now, you ask, what is there left for us to do? Let us take a look at the basement. Once it was just a hole in the earth under the house and used for the storage of fruits and vegetables and accessible only from the outside. Then it became the place for our heating plant and fuel and about the same time we made the discovery that it was a good location for the laundry. We have since found that it is a convenient place for the family car but while it is all of this it is much more. Without losing any of its value as a laundry, garage, or furnace room it can, at very small cost, be made much more attractive and useful for other purposes.

Dry Basement Floors

We have long followed the custom of putting in good, well drained, cement floors, and the foundation of the house has provided very acceptable walls, but for some unexplainable reason we invariably leave the first floor joists exposed; and that is where we make our first and biggest mistake. When we wanted to reclaim the attic we started by covering the exposed roof rafters, and now with the basement it is much the same process but with different materials. With the heating plant located here we want something more fire resistive and permanent than ordinary plaster or wallboard and so we turn to steel ceiling as being an ideal finish. It is much lighter than lath and plaster and this is a decided advantage. Steel ceilings can be nailed directly to the joists without lessening the head room; and once installed and painted a steel ceiling transforms the basement into a place of attractiveness and greater usefulness.

Steel Ceilings for Basements

Steel ceilings have long been used to replace cracked or dangerous plaster ceilings in kitchens, dining rooms, and in fact every part of the home; but here is an opportunity for the builder to use them in the new and more modern home and to take the last step toward removing the unsightly appearance of exposed joists. There is at once a very noticeable improvement in the lighting of the basement for the painted steel ceiling reflects the light rays instead of absorbing them as do the usual wood members.

With this improvement the basement has now taken on a new dignity and has become a place which, as time goes on, the owner finds almost indispensable. The cement floor is either painted or an inexpensive floor covering is used to brighten up the place. Discarded furniture is repaired and painted and again takes its place among the furnishings of the home. Another room has been added which is equally comfortable in winter and summer and we find ourselves wondering why we had not thought of doing this before or why our sheet metal contractor or furnace man had failed to suggest it for it is in his line of work.

Not any single improvement in recent years has contributed more to the usefulness and pleasure of the entire family and one can readily appreciate why a home thus equipped would be more livable, more lovable, and certainly more salable.

*Manager, Steel Ceiling Division, The Edwards Manufacturing Co.

CINDER UNITS

Details of Limestone Veneer

It Is Recommended That an Air Space at Least One Inch Be Provided Between Facing and Backing.

ONE of the largest present day demands for cinder concrete masonry is as a backing for stone, brick, terra cotta, stucco and other facing materials. This occasions no surprise since the cinder unit has all the desired qualities of good masonry. It meets the requirements for strength, permanence and fire resistance, it is a barrier to dampness—and, in addition, this cellular concrete builds insulation into the wall.

High quality in a material will not compensate for poor methods in its use, however. That is to say, the many desirable qualities of cinder units as a backing material can only be fully realized when proper construction principles are followed. Likewise, satisfactory jobs will result only when the facing material, as well as the backing materials, are properly constructed. Considering cinder units as used in the backing of stone, a great majority of jobs are eminently satisfactory. Troublesome jobs, when they occur, almost invariably can be traced to poor workmanship or faulty construction methods.

Discoloration and appearance of efflorescence on the stone facing occasionally causes unsatisfactory jobs. This has rarely anything to do with the backing material; as practically everyone has observed, such instances may occur regardless of whether the backing is brick, clay tile or concrete masonry.

When discoloration is found it is usually due to the presence of impurities in the wall material which are leeched out and carried to the surface by moisture. Efflorescence is a deposit of white crystalline substance on the facing. It is caused by the passage of water carrying the soluble salts dissolved from some constituent of the material; upon evaporation of the water from the surface the salts are deposited.

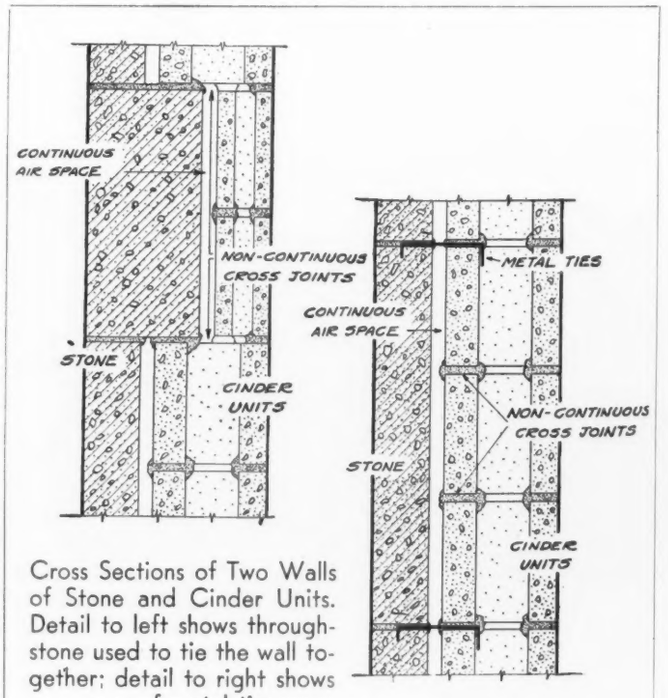
Obviously, before efflorescence and discoloration can occur it is first necessary for moisture to pass into or through the facing material. To prevent this it is only necessary to prevent the entrance of water into the wall. This requires, first, that a high quality facing material be used that is itself impervious, second, that the facing material be laid up so that water will not go through the joints, and third, that adequate flashing be used at joinings, under projecting members and all horizontal surfaces over which water flows or on which it is liable to collect. It is also important to properly protect the masonry during construction.

High quality products are assured by using only those of known standard quality. In case of such well-known natural stone as Indiana limestone full data are available. When local stone is used, it is well to check its past history to see how well it has served similar purposes. Cast stone of excellent quality is being produced. It should meet the specification approved by the Cast Stone Institute which contains the following statement:

> "All cast stone used . . . shall have a compression strength of at least 5000 lbs. per sq. in. and an absorption of not more than 7 per cent when tested in accordance with the American Concrete Institute Tentative Specifications for Cast Stone."

Insistence upon the use of cast stone conforming with this specification insures a high quality product and eliminates one of the common causes of troublesome jobs.

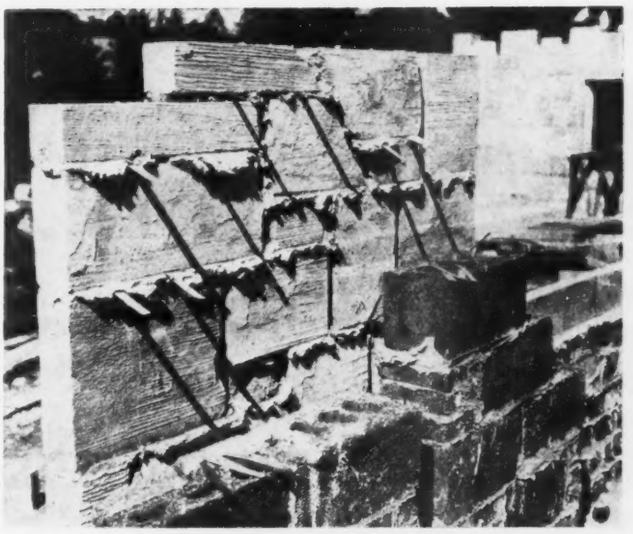
Such organizations as the American Concrete Institute, the Building Code Committee of the United States



Cross Sections of Two Walls of Stone and Cinder Units. Detail to left shows through-stone used to tie the wall together; detail to right shows use of metal ties.

AS BACKING FOR STONE

Over Cinder Block Back-up



Four-Inch Limestone Veneer Tied to Cinder Block Backing with Metal Ties.

Department of Commerce, the Underwriters' Laboratories, and the Building Officials Conference have developed standard specifications for concrete mansonry units. The use of materials meeting these requirements, the provisions of which are essentially the same as those of the specifications of National Building Units Corporation, guarantees high quality cinder units that are reliable.

In the construction of walls of stone backed with cinder units, there are two principles to observe:

First, that the cinder units be laid without continuous cross mortar joints; and, second, that at no point should the facing be continuous through the wall.

Stone facings are commonly bonded to the backing wall by means of metal ties or bonding stone. An air space, approximately one inch wide, is usually provided between the backing and facing. Accompanying drawings and photographs illustrate construction practice. The air space serves as a barrier, preventing any moisture, which may penetrate the face, from entering the back, or which might possibly leech soluble salts from the latter and cause discoloration. Further, the air space adds to the insulative value of the wall. Numerous jobs have been built where no air space has been provided between the cinder unit backing and the stone facing. So far as is known, these jobs have proved to be entirely satisfactory. Best practice, however, is to provide air space.

The non-continuous cross mortar joints commonly used in laying cinder unit walls prevent moisture, which may get through the facing, from passing through the joints to the plaster on the interior. Due to the cellular structure of cinder concrete, the capillary attraction of this material is low, so that moisture is not drawn through the unit itself.

Since the stone facing is a part of the wall which must withstand weathering, and is the first line of defense against moisture penetration, sound construction principles and good workmanship are even more important here than in the backing wall. Reference is made to the recently published specification of the Cast Stone Institute.

Selecting the proper material for facing and backing, and carefully following the specifications here mentioned, will result in jobs of lasting satisfaction.

Indiana Limestone Backed with Straub Cinder Units Forms a Wall of Permanent Beauty for St. Paul's Cathedral Presbytery, Pittsburgh, Pa. Carlton Strong, Architect; Dusquesne Construction Co., Builders.

Type A. Station, Independent Oil & Gas Co., Tulsa, Okla.

More Pleasing Buildings

for Gas and Greasing Service

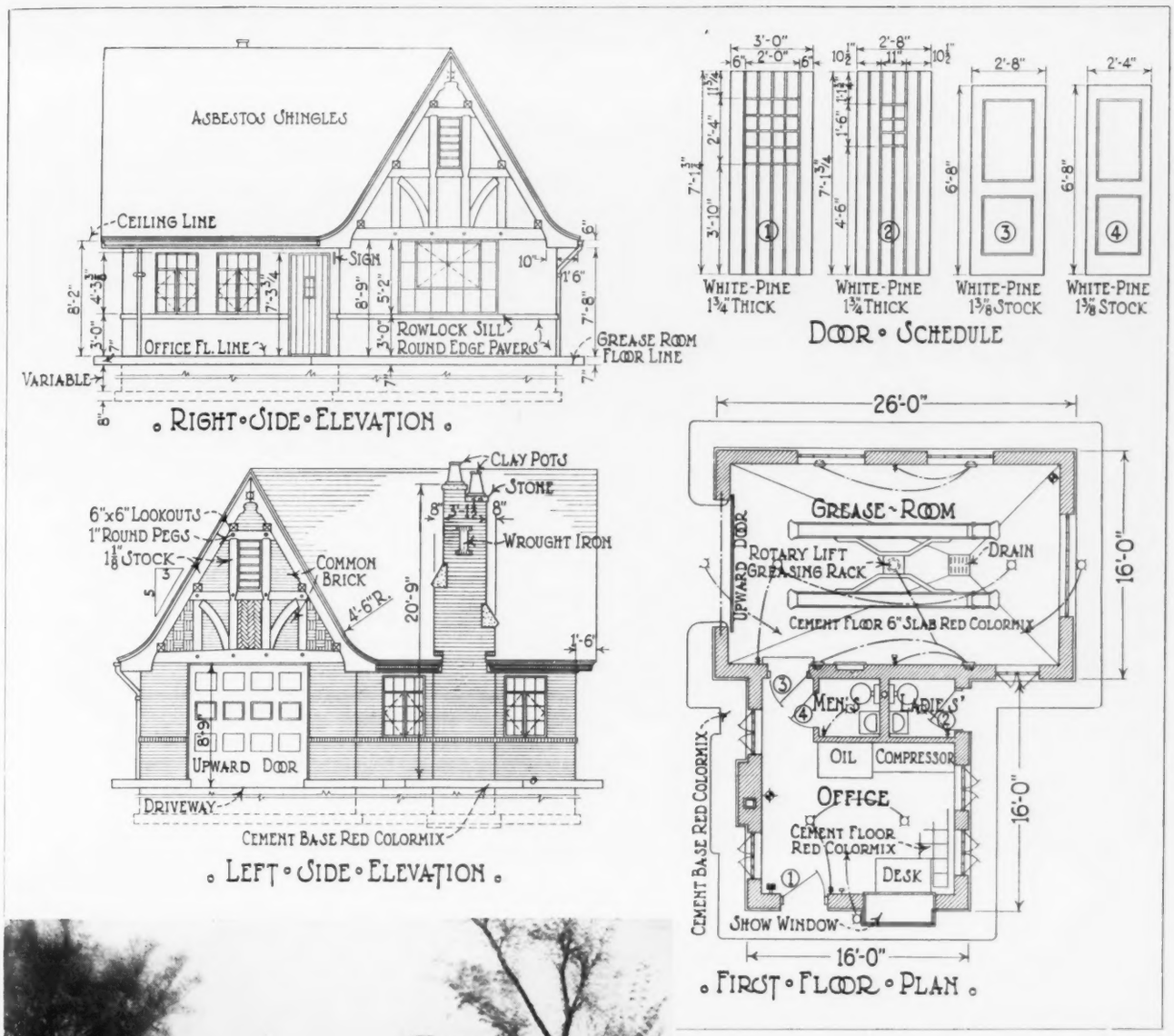
THE movement goes on apace for bigger and better gasoline, oil and greasing emporiums to serve the motoring public. They dot the highways and pre-empt the choicest corners in all of our cities. Some are crude and awkward in appearance, some are garish and gaudy, while some show real taste and beauty in design. As a field of activity for architects and builders, the service station is present with us in a big way.

In general, there are two classes of filling stations; those owned and operated by the big refining companies and other chains, and those owned and operated independently. The former are apt to be of a standard pattern and are constructed by regular company construction crews. The latter, the independent stations, offer perhaps a better opportunity for outside architects and builders. But in both of these classes of stations, the company chains and the independents, there is a strong tendency toward better design. With the growth of the complete greasing business, as well as the addition of tire retailing with tire service, brake service, etc. these service stations are being enlarged to accommodate one or several pits or lift racks completely under cover.

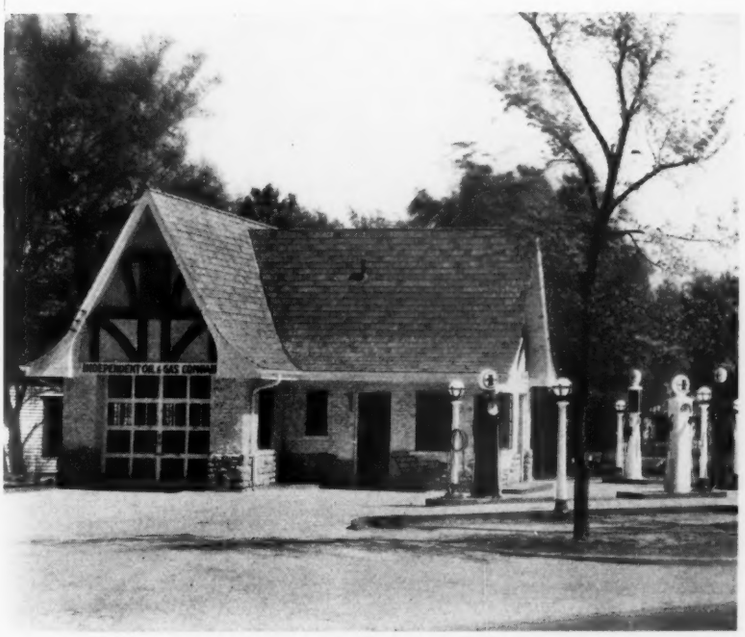
Important items of equipment needed for these present day automobile service stations are gas and oil tanks and pumps, air compressor, lifting racks, and wide garage-type doors, usually of the upward-acting sort.

Structures owned by some of the larger companies have been standardized in the best architectural traditions. For example, a station recently erected in Williamsburg, Va., was of the Colonial period, one of three types in use by the company responsible for it. It accorded with the general appearance of the surrounding buildings and pleased the inhabitants. The West has been notable for its attractive motor service

The Type B Station is of Similar Design and Layout as to Office, but with a Smaller Service Wing.



Plans Prepared by the Architectural Staff of the Independent Oil and Gas Co., Tulsa, Okla.



stations. California pioneered the way and proved that good design in retail establishments is good business. The Southwest followed not far behind and some of our best examples of gas filling stations now come, appropriately enough, from the petroleum producing region of Tulsa, Okla.

We are indebted to the Independent Oil and Gas Company of Tulsa for the designs shown here.

The gasoline and oil refiners have little control over the wayside stations of the independent dealers. Nevertheless, these are being improved to a degree by the force of competition and also by the efforts of the Wayside Stand Committee which has conducted several competitions in wayside stand design under the auspices of the Art Centre of New York City.

In the carefully planned and well constructed establishments, servicing is all-important. It was not so very long ago that motorists had to pay for distilled water for batteries. It was even customary to tip the pump man for filling the radiator with plain water. Now the motorist gets free air, free water, free crank case service. Auto lifts are installed in the new enclosed structures so that, whatever the time of year, servicing may be carried on. This is part of the policy of building up an all-year round neighborhood business.

Eighteen Men Move 8-S

ONE of the most interesting engineering feats in recent years in the middle west was the moving of the eight story general office building of the Indiana Bell Telephone Company in Indianapolis to make way for a new $1,500,000 structure.

This building, 100 feet high and weighing 22,000,000 pounds was moved 52 feet to the South, turned around and moved half a square West without the interruption of a single activity on the part of 600 "hello girls," clerks and other employes of the telephone company.

Business went on as usual during the move. Elevators ran; gas, steam heat, water, electric power and sewage facilities were maintained by flexible connections and long distance telephone circuits, 500 of them, operated normally. Seven submarine type cables were spliced to all telephone lines entering the building. Each of the cables contained more than 200 feet of slack, enough to allow for the move made by the building.

Believe it or not but the engineers figured

One of the Eighteen Modern Sampsons and His Lateral Ratchet Screw Jack Who Moved the 22,000,000-Pound Building.

The Concrete, Steel and Timber Roadway for Moving

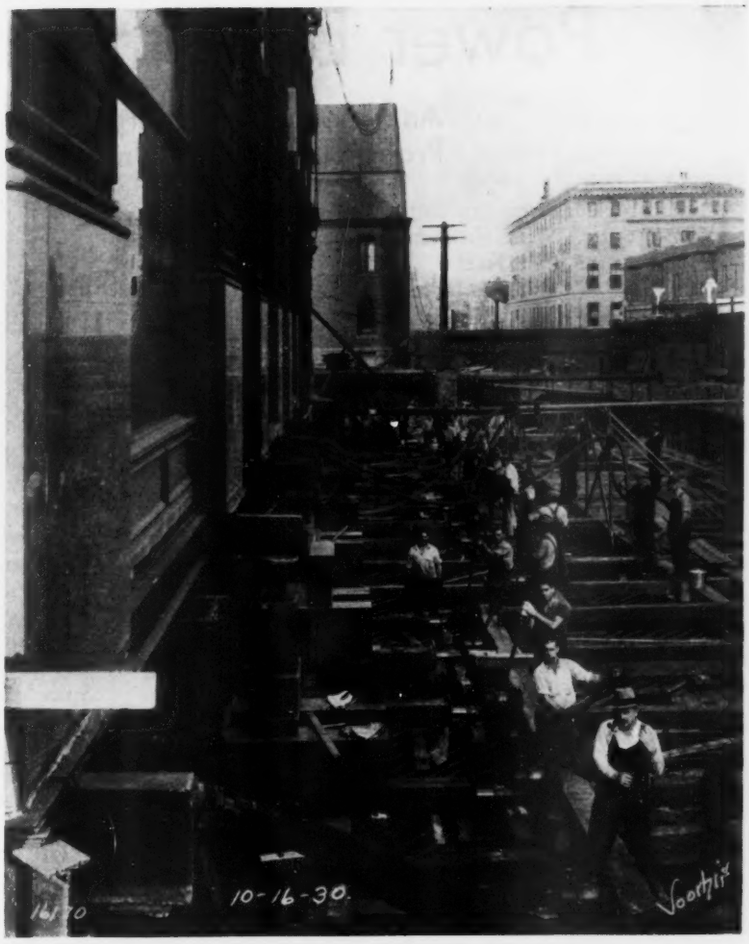
ove 8-Story Building

everything out so accurately that eighteen men did the actual pushing of the building to its new location. They operated eighteen lateral ratchet screw jacks which shoved the 11,000-ton mass of steel and brick along at a rate of 15 inches an hour.

First a concrete mat was laid at the basement level over the entire area over which the building was to be moved. Over this were placed six by eight inch fir timbers. On top of the timbers steel railroad rails were laid about four inches apart.

I-beams were riveted to the fifty-nine steel columns supporting the building to carry the load of the columns to some 4,000 rollers. The columns were tied together with I-beams or latticed trusses and diagonally braced to prevent the columns from shifting positions in relation to each other during the move. About 500 tons of structural steel were necessary for reinforcement.

To each of the steel columns were riveted steel shoes under which were placed the rollers which rolled the building on the steel rails. The John P. Eichleay Jr., Company of Pittsburgh did the work.



The Eighteen Men Who Shoved the Big Indiana Bell Telephone Building to Its New Location and the Lateral Jacks They Used.

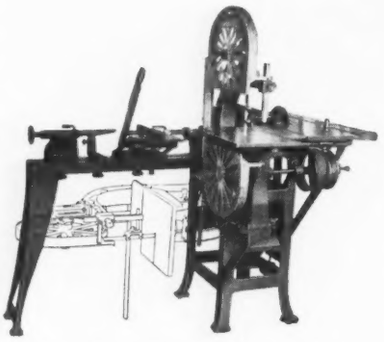
Showing the I-Beams and Supporting Braces.

Power Equipment Cuts Costs

And Enables the Enterprising Builder to Create Profitable Business Under Present Conditions

THE problem of cutting costs receives scant attention in flush times. With business booming, credit easy, and the general price level rising, the production problem appears to be of first importance. It is easy enough then to adjust prices to show a satisfactory profit. But it is an entirely different story in times like the present.

It is when business falls off, credit tightens up, and the price level takes a downward trend, that we get a true appreciation of the importance of cost reduction. Then, it is only by cutting costs to the minimum that it is possible to show a profit at all. At such a time, the organization with the lowest costs has a distinct advantage, too, in getting what business there is to be had.



Practically Any Woodworking Operation Can Be Handled on This Machine Right in the Builder's Own Shop.

For the contractor or builder, power equipment is the answer to the low cost—fair profit problem. In all parts of the country wide-awake builders are utilizing power equipment to get business and make it pay. The builder who maintains his own shop often installs woodworking equipment of the type illustrated. This is a versatile sort of machine which offers great possibilities.

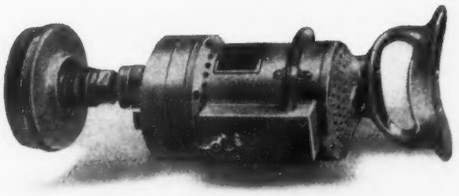
A Complete Woodworker

Such a machine is equipped with a saw table for ripping and cross-cutting; a lathe for every type of wood turning; a shaper for mouldings, trim, and cabinet work; a speed spindle for disc sanding, grinding, and polishing; a jointer; a mortiser, and a band saw which folds out of the way when not in use. All this is combined in one practical machine of ability proved in actual production work.

With this machine installed, the builder has at his disposal what is practically a complete planing mill equipment. When building is slack he can turn out built-ins of all sorts, screens, porch enclosures, lawn furniture and many other items which are readily salable to his regular customers. When building is more active the machine will cut the cost of turning out every piece of wood work used on the building job.

Electric Concrete Surfacer

Not all the power equipment is confined to the woodworking lines. There are any number of tools and machines which are available for concrete work. One of these, which greatly reduces the labor, and consequently the cost, of finishing concrete, is an electric concrete surfacer.



Much Tedious Labor Formerly Used in Smoothing Concrete Is Saved When An Electric Surfacer Is Employed.

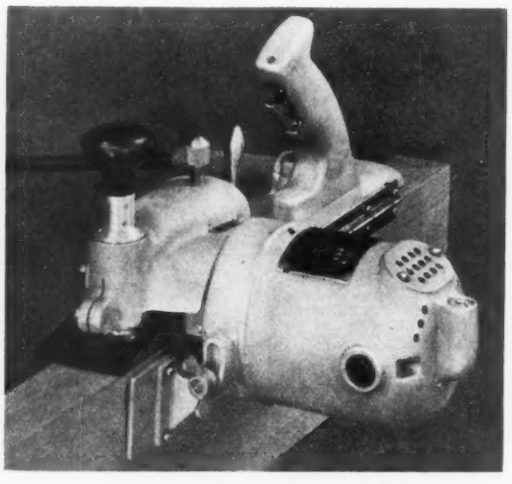
This tool is especially useful in the construction of concrete columns and walls. It is difficult to keep these surfaces reasonably smooth due not only to irregularities in the surface of form lumber, but also to the edges of the lumber. Since concrete used in such construction must be comparatively soft when placed, all these irregularities show on the surface after it has set.

In many instances, where the work is not too extensive, the surfaces can be trued by hand. This method, however, is slow, tedious and costly. Even on small jobs it may be quite a task and the labor cost may amount to a considerable figure. Much of the labor and expense can be saved with this electric surfacer.

A finishing stone is attached to an electric motor designed for the purpose. No flexible shaft is necessary and the surfacer is a compact, hand tool which is connected with the light or power circuit by a cord and plug. Surfaces can be finished quickly and easily with this tool, ready for whatever finishing coat may be desired.

An Electric Door Plane

There are other power tools, too, which can be used effectively in keeping down costs so as to show a profit on the job. Electric hand saws have long since demonstrated superiority over the old fashioned hand saw. Now electric planes are coming to the front. The illustration shows an electric door plane which is light, fast and accurate, and adjustable to any door job.



Just As the Electric Saw Has Replaced the Hand Saw, So the Electric Plane is Replacing the Hand Plane for Fitting Doors.

Fitting doors has always been a considerable item of expense, but with this plane the expense is greatly reduced by speeding up the work. It does not tire the workman so his production and the quality of his work do not fall off toward the end of the day. It leaves a uniformly smooth finished surface which does not require scraping or sanding. It can also be used for fitting sash and transoms.

For Cheaper Grading

When a new development is being opened up there is usually a great deal of grading and leveling work to be done. By far the cheapest and quickest way to handle it

This New Type of Scraper, Used with a Tractor Does Economical Grading on New Developments.

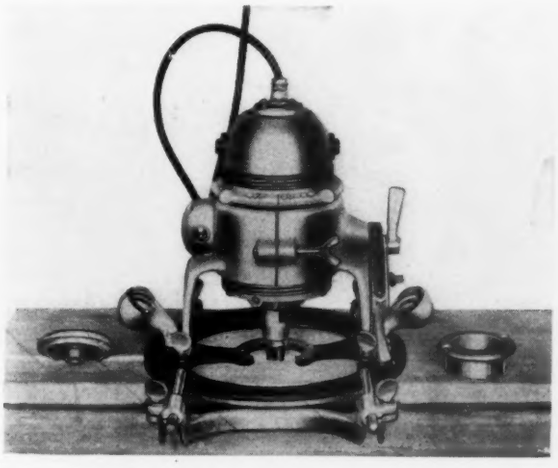
is with a scraper and tractor. For this purpose a new scraper, with hydraulic control, has recently been developed. The hydraulic control gives the operator the ability to instantly control and vary the cutting depth.

A narrower and deeper bowl than ordinary is another feature of this equipment, which makes for easier loading and permits hauling larger capacities with the same power unit, effecting a saving in cost of work. It also makes it possibile to rotate the bowl backward, after loading, to carry its weight on the carrying runners than to drag it. It permits spreading of the contents of the bowl in instantly variable depths, or dumping the load in one pile. The scraper can also be backed up if desired.

Router Tilting Base

Manufacturers of equipment are constantly improving their products to give better, more economical service so that it pays the contractor or builder to keep posted on the latest developments in power tools. One of the new ones is a router tilting base which allows the motor to be tilted to an angle of 45 degrees.

This base permits the cutting of bevels and under-cutting with standard bits and eliminates expensive special bits. The tilting feature also allows a much smaller diameter bit to be used, which means less strain on the machine, longer bit life, and a safe bit to use. The router which fits this base has plenty of power and has proved its quality in actual service.



A Tilting Base for the Router Increases Its Efficiency and at the Same Time, Reduces the Cost of Operation.

Parquette Floor Groover

Among other power tools which are available to the contractor is a floor groover which simplifies the work of the flooring contractor. It is so designed that it is possible, after part of the floor has been laid, to cut a groove into the side or ends of the flooring to receive a key or spline, permitting another section to be fastened to it.

It has always been a problem to get close enough to the floor to cut such a groove properly. This groover enables the operator to cut to any desired depth or width. It is guided from the floor surface being cut and gives a perfect cut. The speed of cutting depends on the operator but is from three to four times as fast as hand grooving.

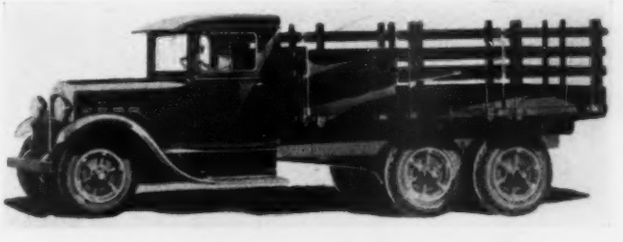
A New Six-Wheel Truck

No discussion of power equipment for builders is complete without reference to motor trucks. The truck is essential to the business of every contractor and builder these days and, if properly selected for the work it is expected to do, there is no question about its cost saving value.

One of the more recent developments in the truck field which is of special interest to contractors and builders is a new, low-priced, six-wheel, six-brake truck which is designed to provide a 3-ton capacity at the cost and operating expense of a 1½-ton truck.

Grooving Flooring After It Is Laid Can Be Done Speedily and Accurately with This Power Tool.

Greater riding comfort as well as increased life due to reduced road shocks, have been obtained in this truck by means of a flexible construction, which allows the individual wheels on either side, or both wheels on either side to move up and down independently. The rear wheels are mounted on two pairs of rear springs, one pair on each side, and the design provides correct weight distribution on all six wheels.



One of the New Truck Models, Designed to Give 3-Ton Capacity at the Cost and Operating Expense of a 1½-Ton Model.

The use of hydraulic brakes on all six wheels assures the greatest driving safety and increased tire mileage is secured by the constant and even distribution of weight, and the independent adjustment of each wheel to uneven road surface.

This truck is produced with either a four or a six cylinder engine developing 48 and 60 H.P. respectively. It is offered in four different wheelbases, the four cylinder in 140¼ and 164¼-inch, and the six cylinder in 144¾ and 168¾-inch.

Scaffolds

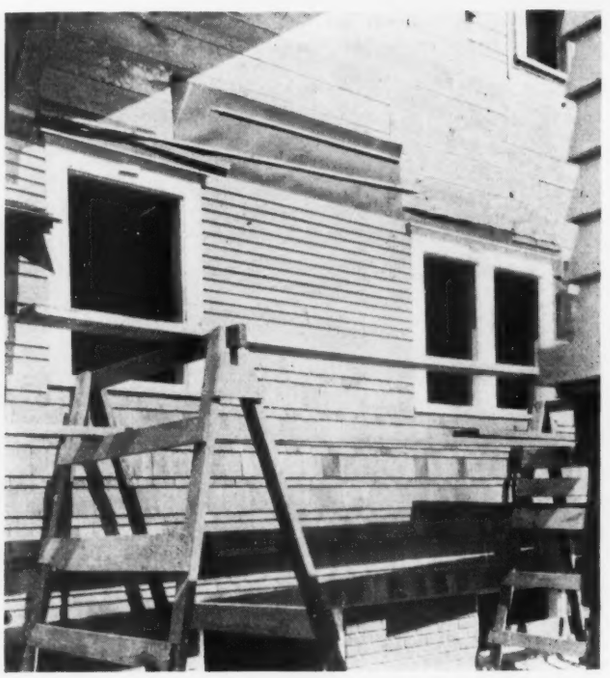
How the other fellow does it is shown in these camera shots from near and far. The editor will welcome construction photographs from readers of American Builder and Building Age and will pay $3 for every one published.

ERECTING HORSES on job at Pelham, N. Y., by Anthony Smith; note pin anchors. In insert—notched piece used for scaffold support by S. T. Briggs, Essex, Md.

POINTERS' SCAFFOLD as rigged up by J. E. Sheule, Brookline, Pa. Method of fastening supports inside is shown at left below.

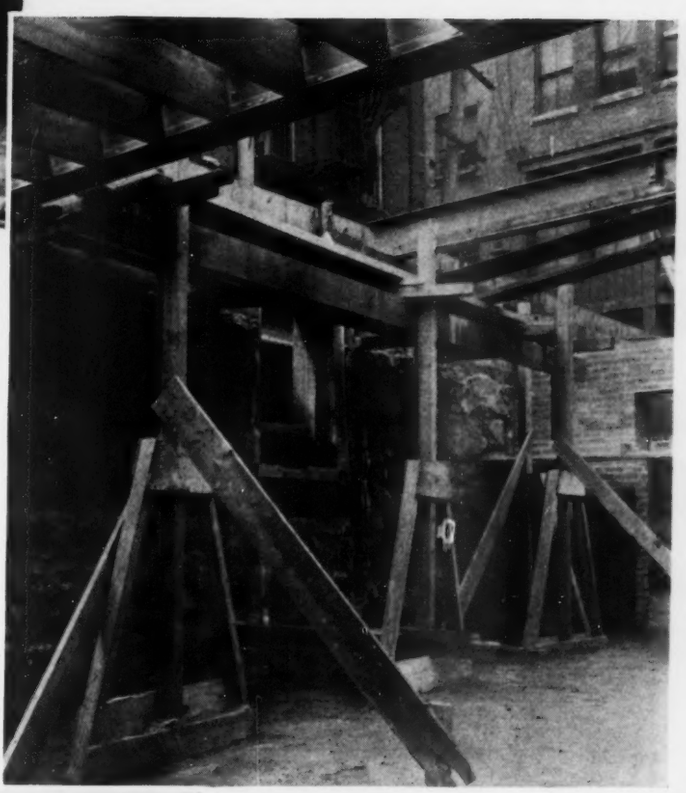
HIGH HORSES (right) employed by Oscar Moody, Cheyenne, Wyo., in putting on siding; note use of strips to hold paper out of way.

INTERIOR SUPPORTS (below) for pointers' scaffold as used by J. E. Sheule. Exterior at right above.



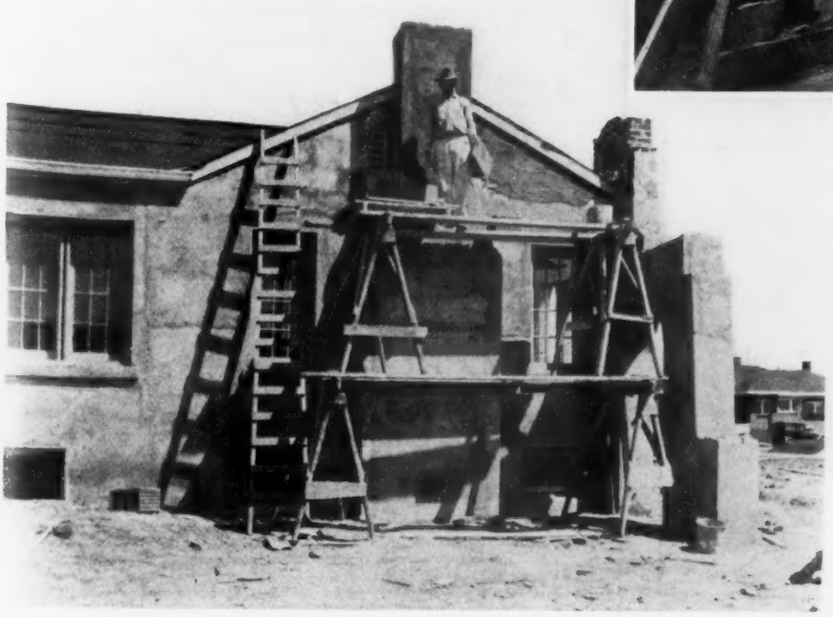
On the Job WITH BUILDERS

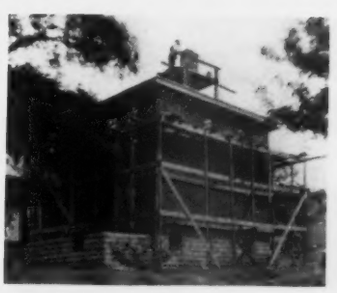
SCAFFOLD BRACKET used by Contractors Semple and Clark of Boston on building at Watertown.



HEAVY SUPPORT for high scaffold (right) as used by C. A. Golden, Manchester, N. H., in first floor construction.

DOUBLE DECK scaffold erected by F. D. Heath in applying stucco coat on house under construction at Denver, Colo.





DOUBLE SCAFFOLDING all around house; Robert Graynor, Pittsburgh, builder.

How NOT to Frame a Roof

By L. PERTH

NOT long ago the writer had an opportunity to watch a group of carpenters putting up a roof over a brick building.

It did not appear as though the work should have offered any difficulties to the veteran carpenters who were about to tackle the job; for it was a plain rectangular building and called for a common hip roof. However, judging by their actions, it seemed that the men were not sure of themselves and were not certain as to how to approach the job.

The man who was in charge of the work had walked around the building, climbed on top of it, examined the lumber that was to be used for the work and finally held a consultation with his men as to how to proceed with the operations.

One of the men produced a steel square. They all looked at the numerous tables and graduations on both faces of the instrument, which were prepared to facilitate the solution of many problems confronting the carpenter in his daily work and expressly intended for roof framing; but no one seemed to know how to use them.

The foreman disgustedly made the remark that any good carpenter ought to be able to frame a roof without a steel square and ordered his men on top of the building to follow his instructions. What followed was very amusing,—except that it was sad to the fellow who paid the bill!

A board about six inches wide was placed on the center line of the building, and on it the height of the proposed roof was marked as shown in Fig. 1. Now that the height of the roof was established, all that remained to be done was to cut the rafters so that they fit snugly against each other and also against the surfaces that are to be framed; and here is where the real fun began.

A piece of 2 by 4 of considerable length was hoisted up and set against the vertical board at the level where the height of the roof was marked. The lower end of the rafter was resting on the edge of the plate as shown in Fig. 2.

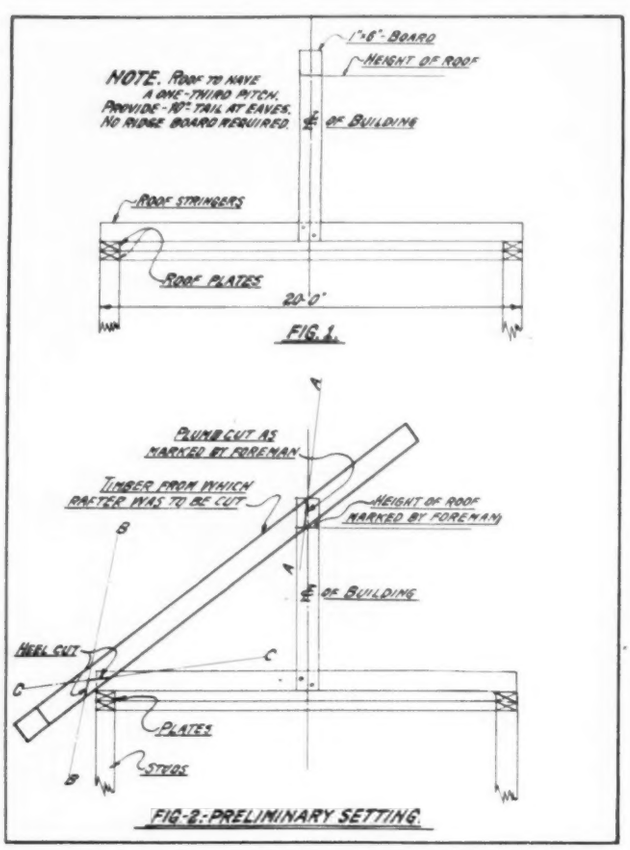
While the two men were holding the rafter rigid at both ends the foreman marked what he thought should be the plumb cut and then proceeded to the lower end and marked the bottom cut. Since the roof called for a 10 inch tail, this was properly measured off from the edge of the plate; and the rafter was pronounced ready to be cut.

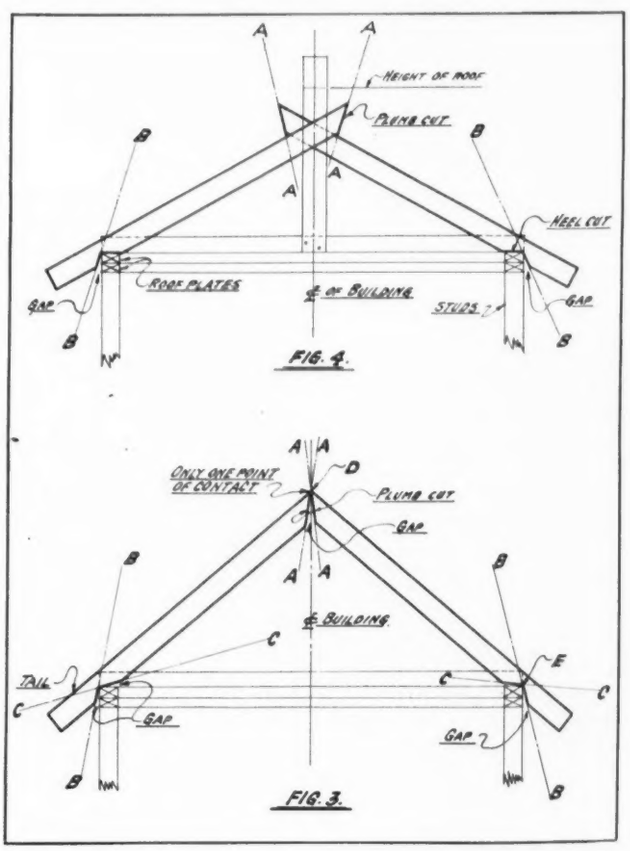
"If you can cut one you can cut them all," said the head man with a devilish twinkle in his eyes. "It's easy if you know how," he concluded and ordered the rafter to be taken down, cut as indicated and to be used as a pattern for the rest of the common rafters.

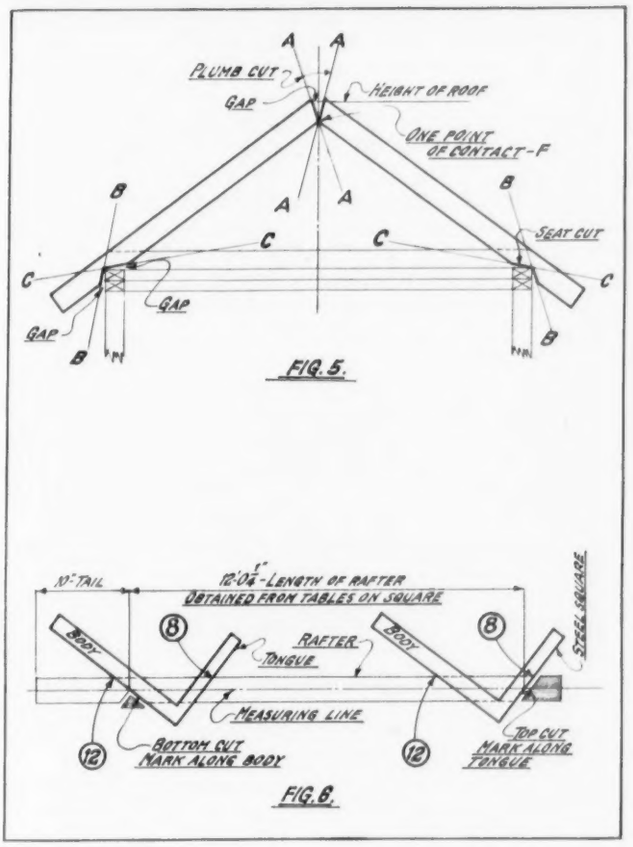
However, after a dozen pieces were cut the men were called to a halt. "Wait a minute, boys, I am sure we measured them right; but let's put a couple of them up and see how they look." The roof did not call for a ridge board, therefore the upper ends of the rafters were to butt against each other.

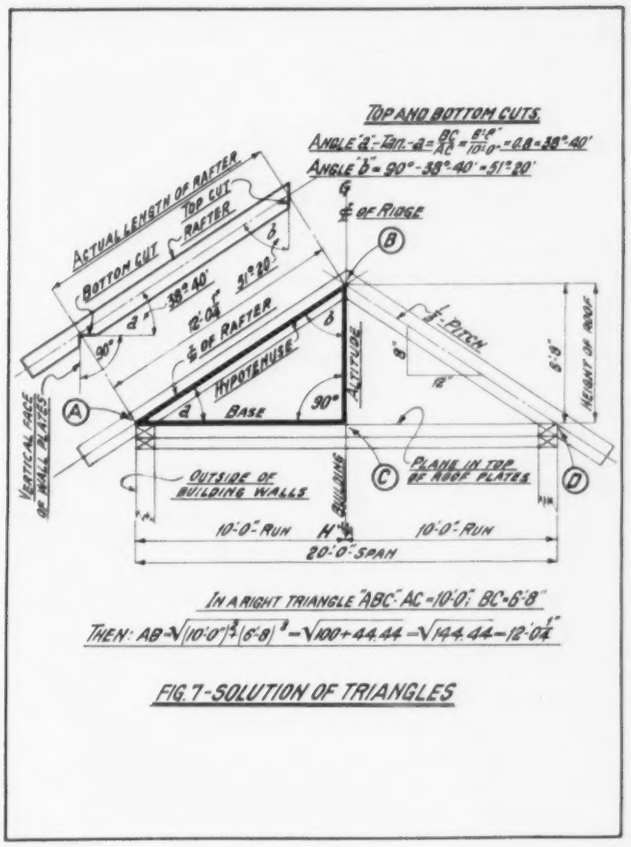
When a pair of rafters were set up the foreman and his men discovered that there is a whole lot more to roof framing than they thought there was; for the rafters appeared as shown in Fig. 3.

The surfaces along the lines AA instead of bearing









against each other formed a wide gap at the bottom, tapering to the top. There was only one point of contact at D.

The same condition occurred at the roof plates. Neither horizontal surfaces CC nor vertical surfaces BB of the heel cut did fit the plates. There also was only one point of contact at "E" and two gaps where the heel was supposed to hug the plates snugly.

The situation was rather perplexing. It was evident that the rafters could be framed in this manner, since the gap at the top did not permit the nailing of the rafters together, and the openings at the heel weakened the roof considerably and a slight pressure might break the tail end off.

An attempt was made to make the horizontal surfaces CC bear against the plates to provide partial stability at the base of the roof even though the vertical surfaces of the top cut did not bear snugly against each other.

When the rafters were nailed at the bottom they appeared as shown in Fig. 4.

Someone suggested to set the rafters up in such a manner as to make the vertical surfaces BB of the heel cut come as close to the plates as possible; that perhaps would make the vertical faces of the top cuts of the rafters come together. This was done but the condition was not remedied since the rafters did come together only at point F, and the ridge had a gap at the top as shown in Fig. 5.

The job was becoming rather complicated; but the foreman was determined to shape the rafters until they fitted. "The bottom cut," he said, "does not matter much, it is the tops of the rafters that cause the trouble. Let us cut them off until they meet."

Several slices were taken off the tops of the rafters until the vertical surfaces did meet. When this was accomplished the height of the roof was reduced by one-third and there still was a gap at the seat of the rafters.

It was too evident that the cut material could not be used. A pile of good lumber had to be thrown away, the men had wasted their time for several hours and the job was not yet begun.

The Correct and Easy Way

These men did not realize that they were tinkering with problems in trigonometry, that a roof is composed of triangles and that framing a roof means to know something about the solution of triangles, i.e., one must have the ability to determine the length of sides, the slopes and angles that form the shape of the roof. Carpenters are not expected to be mathematicians; and, if they were, it would not be practical to do calculations on the job.

Therefore to assist the carpenter in solving his mathematical problems the steel square was perfected. This instrument, the construction of which is based on the principle of right triangles, may be truly defined as "carpenter's trigonometry"; and in the hands of one who is conversant with its use becomes a simple calculating device of the most wonderful capacity.

In timber construction of every description the steel square is the carpenter's best assistant; but it is in bridge and trestle work, and particularly in roof framing, that its use becomes most indispensable; for it contains valuable tables and scales that make roof construction simple.

These tables, carefully prepared by experienced mathematicians, give at a glance the exact lengths of the various roof members and also the top and bottom cuts as well as side or cheek cuts for all common, hip or valley and jack rafters. And if the men on this job had been capable of using the steel square they would have

approached the work in the simple manner shown below and thus have saved themselves a lot of time, labor, material and unnecessary grief.

The problem facing the men could be stated like this: "Cut a common rafter for a roof 20′-0″ wide and of one-third pitch. 10″ tail. No ridge board.

Solution: From the tables on the steel square obtain the length of the rafter which is 12′-0¼″. For top cut use 12 inches on the body and 8 inches on tongue. Mark along the tongue. For bottom cut use same figures. Mark along body. See Fig. 6.

Let us analyze how the various values are obtained from the tables on the steel square and how this instrument is actually applied on the job.

First we will illustrate our statement that roof framing implies the solution of triangles. By referring to the diagram in Fig. 7 it will be noted that the building is 20 feet wide and the roof is of one-third pitch which makes the total rise of the roof equal 6′-8″. The rafters form the large triangle ABD, its base being AD or a line drawn in the plane of the top of the plates.

The center line of the building, GH, divides the large triangle into two smaller ones, ABC and DBC. These triangles are equal to each other and since the center line of the building is at right angles to the plane of the plates these two are right angles for their hypotenuse the common rafters.

Now our problem may be formulated like this:

In a right triangle ABC two sides, AC and BC, are known. Find the length of the hypotenuse AB. Since the hypotenuse represents the common rafter it is the length of this member that we want to establish.

The consecutive steps taken in the solution of this problem are clearly illustrated in the diagram and represent the usual method employed by the architect or his draftsmen in dealing with problems of this nature.

It is evident that this process while being absolutely correct would prove to be utterly impractical for use on the construction job. We will show how the steel square does the work.

The problem as previously formulated was to cut a common rafter for a roof having a one-third pitch, the run of the rafter being 10 feet. See Figs. 8 and 9.

First the length of the rafter must be established by the following rule:

On the outer edge of the blade locate the figure indicating the run. The length of the rafter will be found under this figure by following the line of the corresponding pitch. These are trigonometrical values calculated for triangles having the same base but different altitudes.

Refer to diagram in Fig. 9. Under 10, which represents the run, there is a column of figures giving the lengths of rafters for various pitches. Since the roof in our case is of one-third pitch we follow the third line in the tables and find the length of the rafter being expressed as 12-0-3 which means: 12 feet 0 inches and 3/12 of an inch, or 12′-0¼″. This is the "actual length" of the rafter and does not include the tail or lookout which usually is added to the length after same has been established.

The diagram in Fig. 10 shows step by step how the instrument is actually applied on the job.

Procure a timber of sufficient length and snap a center line on it. Proceed from the bottom by laying off the 10″ tail. From this point measure off the distance 12′-0¼″—the actual length of the rafter. All dimensions must be taken on the center line.

Now for the cuts at the top and bottom. Since these are being governed by the pitch they are very easily obtained in the following way:

A one-third pitch roof is one having 8 inches rise to each 12 inches run. To obtain the bottom or seat cut lay the square on the rafter so that the body will coincide with the lower end of the rafter. Take 12 inches on the body of the square and 8 inches on the tongue. Twelve inches on the body will give the horizontal cut. Mark along the body.

For the top or plumb cut move the square so that the tongue coincides with the upper end of the rafter. Mark along the tongue of the square.

Both cuts are obtained by applying the square so that the 12 inch mark on the body and the 8 inch mark on the tongue shall be at the edge of the stock.

We wish to emphasize the fact that the members of a firmly constructed roof should fit snugly against each other. Rafters that are not properly shaped make a shaky roof and impair the stability of the structure.

It also is well to remember that in these days of keen competition and high efficiency workmen are required to do the work right at the outset and no "cut and try" methods could be tolerated.

Therefore it is well worth while to obtain a good steel square and study this subject. This will not require much time, neither is it requisite to possess any special ability. The returns will be manifold as compared with your small investment.

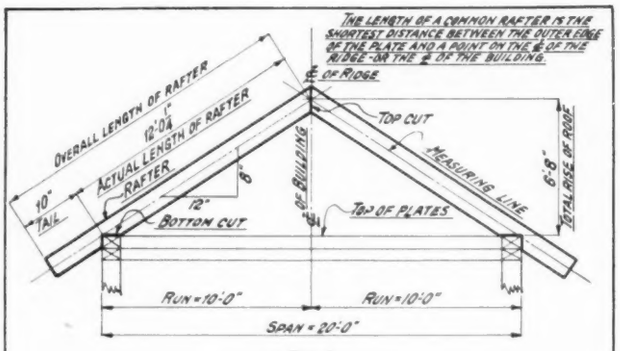

THE LENGTH OF A COMMON RAFTER IS THE SHORTEST DISTANCE BETWEEN THE OUTER EDGE OF THE PLATE AND A POINT ON THE ℄ OF THE RIDGE ON THE ℄ OF THE BUILDING.
℄ OF RIDGE
OVERALL LENGTH OF RAFTER
12'-0¼"
ACTUAL LENGTH OF RAFTER
10" TAIL
8"
12"
BOTTOM CUT
℄ OF BUILDING
TOP CUT
MEASURING LINE
TOP OF PLATES
6'-8" TOTAL RISE OF ROOF
RUN = 10'-0"
RUN = 10'-0"
SPAN = 20'-0"

FIG. 8

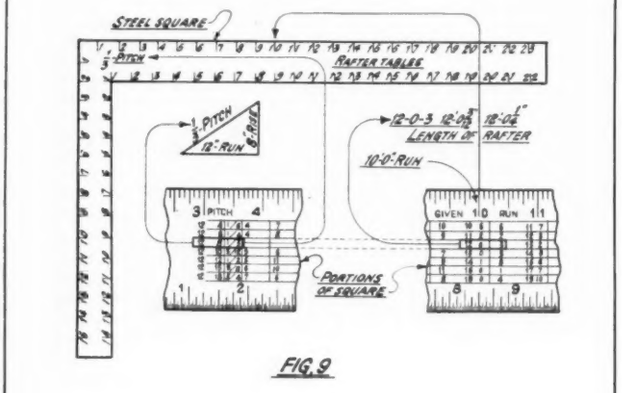


FIG. 9

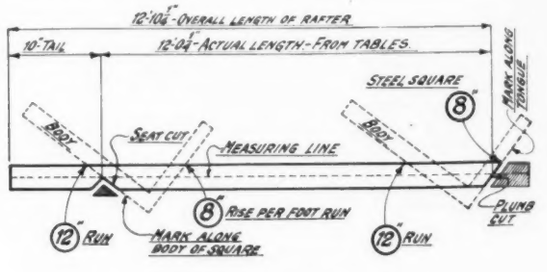
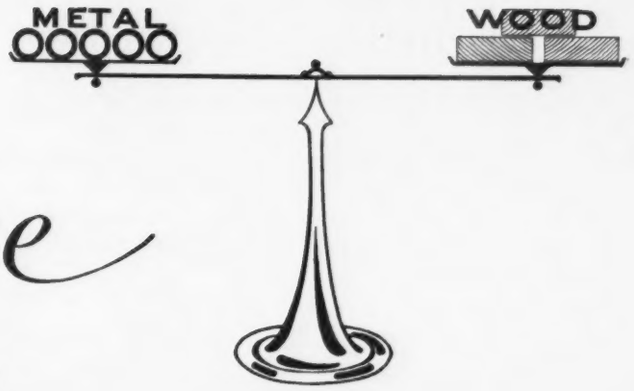
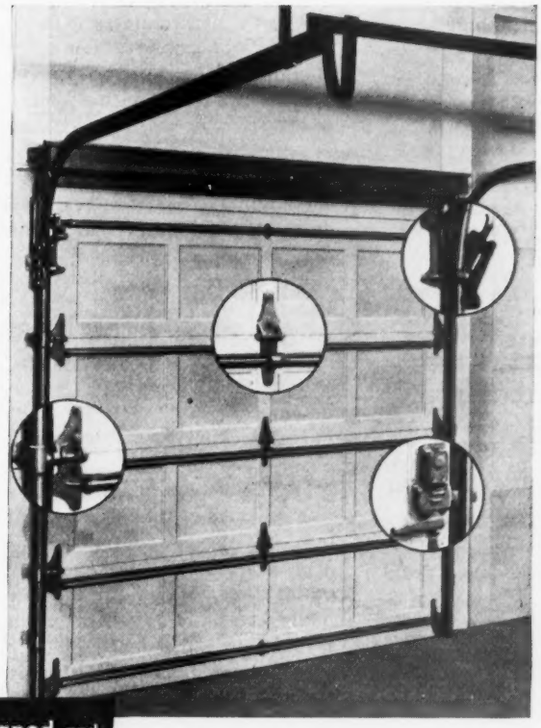


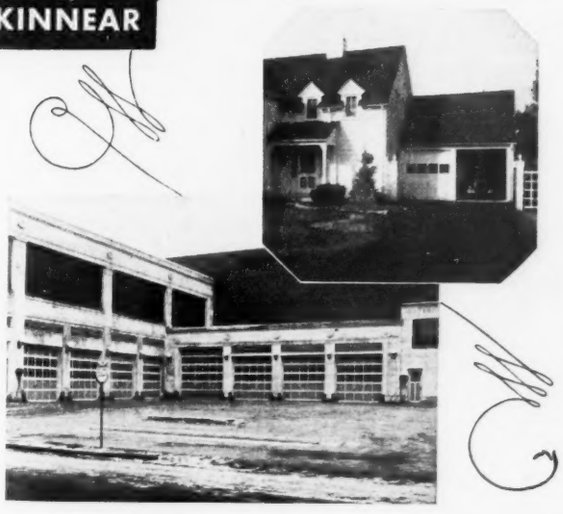
FIG. 10 - APPLYING THE SQUARE.

All in Balance





Designed and Engineered by KINNEAR



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Metal . . . wood . . . both properly proportioned in a new and better type of garage door—effecting lightness where desired; strength where needed and a thoroughly balanced construction—assuring years of uninterrupted service and dependence, along with out-of-the-ordinary ease of operation.

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Building Activities

The Month's News of the Industry

New Law Makes Building Business Stabilizer

ENACTMENT, at the last session of Congress, of the Wagner Bill for the advance planning and regulation of public construction has placed in the hands of the President of the United States a sure means of maintaining general business stability in the future, according to a statement from the officials of the Associated General Contractors of America, made at the opening session of its new executive cabinet.

With a six-year advance plan of public construction laid down in detail, as required by the new law, several billion dollars worth of business will be in reserve at all times to be thrown into the breach as needed, when business begins to lag.

The theory of using the construction industry as a balance wheel of business, to be accelerated in times of depression, has been generally accepted for some time, but the available means for such acceleration has, in the past, been too slow to be effective. Under the six-year plan, however, a sagacious and well-advised executive, with the co-operation of Congress, will be able to apply the necessary stimulus before the slowing down of business is generally appreciated, according to A. P. Greensfelder, of St. Louis, Mo., President of the Associated General Contractors.

Small Mills Join S.P.A.

AT the recent annual meeting of the Southern Pine Association, it was reported that 65 small sawmill operators had already been signed up for the special service which the association is extending to these small mills. Since these 65 mills normally ship more than 400 million feet of lumber a year, this is an important step toward the standardization of an important volume of southern pine production which has not, in the past, been standardized.

A code of ethics, regulating the distribution of lumber, was also adopted at the meeting. This code provides that the retail lumber dealer is recognized as the proper distributor within his territory of all business done with departments of state and federal governments, shipyards, and large dock builders, railroads and large users of industrial lumber who buy regularly in carload lots not for purposes in connection with building construction.

Coming Events

May 11-14, 1931—National Fire Protective Association, Annual, Royal York Hotel, Toronto, Canada.

May 14-15, 1931—Florida Lumber & Millwork Association, Annual, Orlando.

May 25-27, 1931—American Institute of Quantity Surveyors, Annual, Netherlands Plaza Hotel, Cincinnati, Ohio.

May 26-30, 1931—National Association of Real Estate Boards, Annual, Lord Baltimore Hotel, Baltimore, Md.

Aug. 10-15, 1931—United States Building & Loan League, Annual, Bellevue-Stratford Hotel, Philadelphia, Pa.

Oct. 13-16, 1931—Illuminating Engineering Society, Annual, William Penn Hotel, Pittsburgh, Pa.

Large Development Planned

A STRIKING feature of the $41,000,000 Lake Pontchartrain project, which New Orleans, La., is pushing toward completion, is the selling of a public improvement to the public, at a profit to the city. While the reclamation of waste land is an old story, it is seldom that a project reaches the scope of the New Orleans enterprise.

The plan presents an interesting chain of causes and effects. In the first place Lake Pontchartrain figures in the flood relief plan for the lower Mississippi River, as a diversion pond. For the protection of the city, a seawall was necessary in carrying out this plan. With the seawall in place, much valuable land could be made from what was normally a swamp area.

So, the City of New Orleans embarked on the development of 1,900 acres of exceedingly valuable residential property. The value of this property will more than repay the city for its expenditures. The primary feature in the development, the building of the seawall, erected at a cost of $2,000,000, is now practically completed.

Will Make Preformed Cable

THE American Chain Company, Inc., has announced that one of its subsidiaries, the American Cable Company, New York City, has concluded negotiations with the American Steel and Wire Company, a subsidiary of the United States Steel Corporation, to manufacture preformed wire rope under a license agreement.

A.I.A. States Policy

A MOVEMENT to raise the standards of architecture throughout the country was launched at the annual convention of the American Institute of Architects, held at San Antonio, Tex., April 14-16. A resolution was adopted declaring that a policy of employing private architects on the Federal building program should be adopted for all municipal, state, and federal projects.

The Institute bases its policy in this matter on the need for the highest standards of architecture in the construction of public buildings and the opinion that a national policy of encouraging private business initiative is wise. It was stated that, outside of Washington, D. C., of 378 buildings to be erected in the United States, only 40 buildings, in 18 states, have been designed by architects in private practice, leaving the remaining buildings in the office of the Supervising Architect of the Treasury.

The Institute claims that this policy does not provide the best architectural skill for the designing of these public buildings and that it is unwise and unfair treatment of the architectural profession.

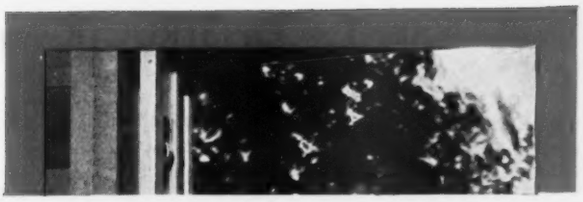
It was also proposed at the convention, that the building and real estate interests of the country should join in a program of research, both local and national, to determine the quantity and quality of building needs of the country, to guide the development of communities and to stabilize building and real estate activities, and achieve a greater business stability.

Sign Largest Contract

DECISIVE commitment of the United States Government to the largest engineering construction contract which it has ever awarded was recently made when Secretary of the Interior Ray Lyman Wilbur, signed the $49,000,000 agreement for the building of the Hoover (Boulder) Dam. The Six Companies, Inc., to which the contract was awarded was represented by W. A. Bechtel, its vice-president.

The Six Companies, Inc., was formed especially to undertake the construction of this huge dam—is composed of the Utah Construction Co., Ogden, Utah; Kaiser & Bechtel Contruction Co., San Francisco and Oakland, Cal.; Morrison & Knudson Co., Boise, Idaho; J. F. Shea & Co., Portland, Ore.; Pacific Bridge Co., Portland, Ore.; and McDonald & Kahn, San Francisco.

Even before the actual signing of the contract work had been started and the contracting organization had expended more than a quarter of a million dollars on the project.



Here's a leakproof window frame you can set up in 6 minutes

New Andersen Master Frame saves 3½ hours labor time on average job

Builders tell us they are setting up the new leakproof Andersen Master Frame in 6 minutes. They figure they are saving 3½ hours labor time on the average house job.

Andersen jamb lugs rest squarely on the header, which saves all blocking under the sills. Now a carpenter can cut all trim and fit all sash, at the bench, in one operation.

Remember, too, Andersen has a new price range and two remarkable values in frames. One frame is of genuine White Pine, and one of clear Pondosa Pine. The important joints of the Pondosa frame are primed with special aluminum paint. Write us for a free demonstration of this new frame.

Have you seen the new ANDERSEN MASTER WEATHERSTRIPS? *A metal strip which cuts draft 86%; costs less than $1 per set*

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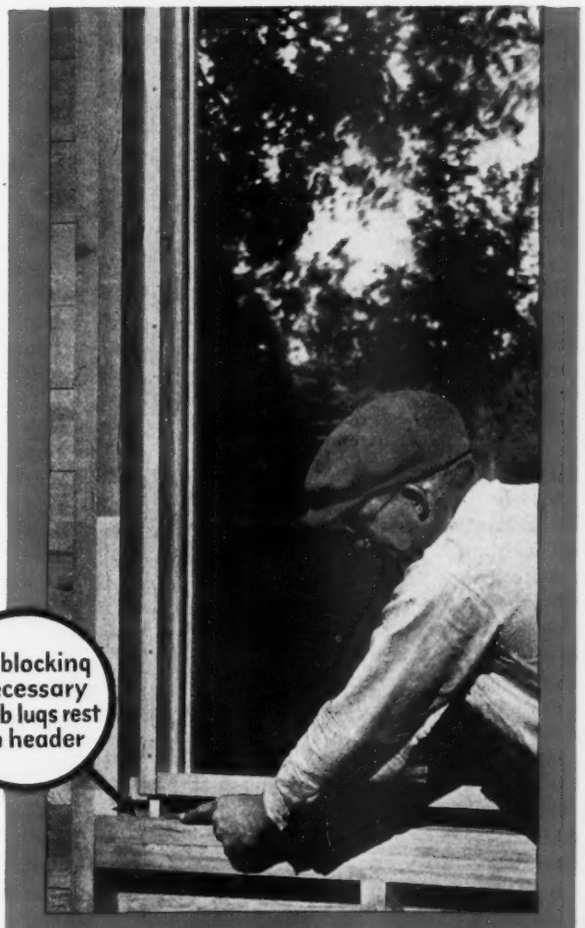
Represented by 4,000 Leading Jobbers and Dealers



Note how jamb lugs rest squarely upon header. This eliminates all blocking under sills.

Residence, East Hartford, Conn.; Architect, Walter Crabtree, Jr.; Contractor, Peter S. Jessen; Andersen Frames furnished by Hartshire Pine Co.

Andersen MASTER Frames

for a leakproof installation

CURRENT CONSTRUCTION FIGURES

AS predicted earlier in the year, residential building has definitely taken the lead in the trend toward normal conditions in the building field. While residential construction for the first quarter of 1931 showed a decline of 3.8 per cent in valuation of contracts awarded, the loss was concentrated in January, before the new trend had gotten under way. February showed a distinct gain over February of last year and March held its own.

On the basis of floor space, the showing is even better, with a gain of 2 per cent for the first quarter of 1931 over the first quarter of 1930. Since construction costs have dropped to a definitely lower level, the floor space data probably reflects the comparative construction volume more accurately than does the dollar valuation.

In the large metropolitan centers residential construction is closely approaching its normal percentage of the total volume. In the New York Area, where residential building accounted for only about one-third of the total building volume in 1930, it had reached the 58 per cent mark as early as February of this year.

Also in line with earlier predictions, the decline in non-residential building still continued, and there is little immediate prospect of an upturn. Total building for the quarter showed a decrease of 24 per cent from the same period of last year, the improvement in residential building not being great enough to offset the loss in non-residential construction.

March, on the other hand, registered a loss of only 19 per cent in total building, with a total volume of $505,234,193. This total was divided between the various classes of construction as follows:

Residential Buildings	$209,258,623
Commercial Buildings	40,354,160
Factories	22,682,110
Educational Buildings	26,754,640
Hospitals and Institutions	14,347,410
Public Buildings	14,500,860
Religious and Memorial	4,674,340
Social and Recreational	5,768,070
Public Works and Utilities	166,893,980
Total Construction	$505,234,193

These figures show the total volume of contracts awarded, in the entire United States, as estimated by the AMERICAN BUILDER AND BUILDING AGE. They were arrived at by taking the figures of contracts awarded in the 37 states east of the Rocky Mountains, as compiled by the F. W. Dodge Corporation, and adding to them factors to provide for building in the 11 Rocky Mountain and Pacific Coast States, and for the smaller and unreported projects not covered by the Dodge reports.

In the 11 western states, the building volume is normally about 10 per cent of the volume for the rest of the country. For March, the record of building permits in these states, as compiled by S. W. Straus & Co., indicates projects amounting to 12 per cent of the total for the other 37 states. With this as a basis 10 per cent has been taken as a conservative factor in arriving at the AMERICAN BUILDER AND BUILDING AGE estimate.

The Dodge Corporation states that its reports do not include any building, modernizing or repair contracts of less than $5,000. While these contracts are small, individually, they make up a large proportion of the entire construction volume of the country. This is ordinarily estimated at 25 per cent of the total.

Much of this smaller work is in the rural communities, where building does not get under way as early in the spring as it does in the metropolitan centers. The favorable weather conditions which prevailed in most parts of the country this year have made possible early progress in rural building, however, so that the volume is now close to its normal ratio. A factor of 24 per cent, therefore, has been applied to the estimate to account for the smaller unreported work. Since practically all of the unreported work is home building, it has been classified as under Residential Building in the tabulation.

Building and Loan Grows

BUILDING and loan associations have been growing at a rapid rate during the last decade. In 1920 the total resources of all building and loan associations in the United States were $2,519,914,971. During the ten years following, their gain in assets was over 257 per cent. The following table shows the growth, by years, during this period:

Year	Number of Associations	Total Membership	Total Assets
1920	8,633	4,962,916	$2,519,914,971
1921	9,255	5,809,888	2,890,764,621
1922	10,009	6,864,144	3,342,530,953
1923	10,744	7,202,880	3,942,939,880
1924	11,844	8,554,352	4,765,937,197
1925	12,403	9,886,997	5,509,176,154
1926	12,626	10,665,705	6,334,103,807
1927	12,804	11,336,261	7,178,562,451
1928	12,666	11,995,905	8,016,034,327
1929	12,342	12,111,209	8,695,154,220
1930*	12,000	12,200,000	9,050,000,000

* Estimated.

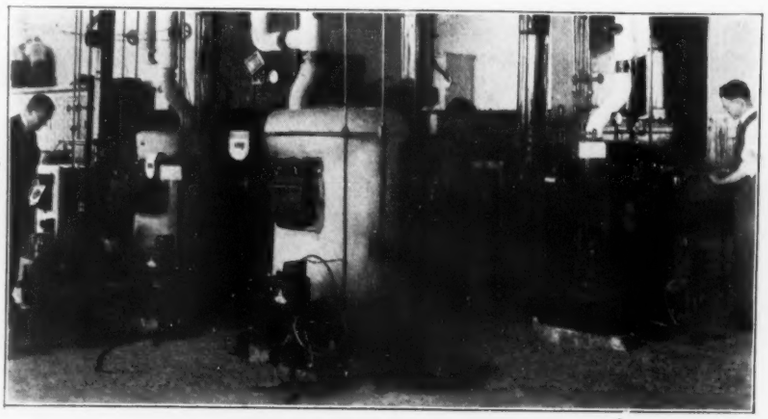
Build Dunbrik Plant

THE organization of a new enterprise for the manufacture of Dunbrik has recently been completed at Muskegon, Mich., by the Stonecraft Company of Grand Rapids, Mich., in association with the P. J. Connell and other leading building supply dealers in western Michigan. The new organization will be known as the Muskegon Dunbrik Company.

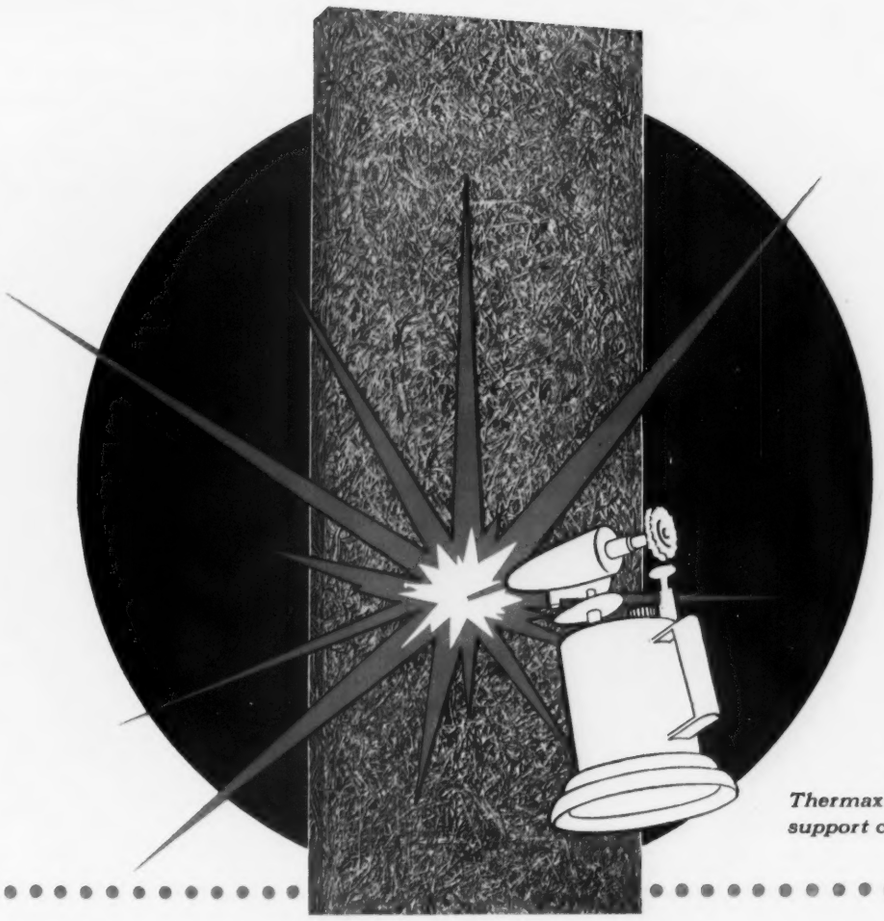
The construction of an up-to-date plant, with a capacity of 24,000 units per day, is already under way. Building plans, specially designed for the efficient production of this new building unit, are under the supervision of the engineering department of the W. E. Dunn Mfg. Co., Holland, Mich.

Train Oil Burner Men

REALIZING that a technically trained oil burner man is essential to each dealer's organization, the Silent Automatic Corporation, of Detroit, Mich., is now conducting a school at its plant. This school offers a six-day course which embraces practically everything ranging from theory of combustion to installation and service work in the field. It is open to members of the various dealers' organizations.



A Department of the Silent Automatic Oil Burner School Where Performance Tests of Various Types of Equipment Are Made.



Thermax positively will not support combustion.

NOW... *for the first time in America a Really Fireproofing Insulation Board*

4

PROVABLE FACTS ABOUT THERMAX

1. **Insulation:** Thermax combines insulation with fireproofing qualities not provided by any other insulation board.
2. **Fireproofing:** Thermax, tested in accordance with the standard fire test specifications of the American Society for Testing Materials, meets the requirements for Class A fireproof construction.
3. **Structurally Strong:** Thermax satisfies code requirements for self-supporting insulated roof-decks.
4. **Sound-Deadening:** Thermax 2″ partitions transmit less than one-fifth of one per cent of sound.

Thermax standard boards are 1″, 2″ and 3″ thick, 20″ wide and 64″ long. Other lengths if specified in reasonable quantities.

Thermax—the fireproofing insulation—is a remarkably efficient and economical insulating board. It is not new. Originated in Europe, Thermax already has had twelve years of practical use in nearly every European country. Now it is being made in the United States in accordance with American building standards and specifications.

Here at last is insulation *plus* fireproofing. Thermax is a truly fireproofing insulation board. Made of treated wood and minerals it has lightness and structural strength. It is vermin proof, odorless, permanent and it gives adequate insulation in single thickness. Thermax has the thickness necessary to give real thermal insulation and provides fireproofing qualities not found in any other insulation board—yet the cost is moderate!

Thermax is ideal for walls, partitions, ceilings and roof decks. It offers, *in one product*, insulation, fireproofing, sound-deadening and a perfect base for plaster. Thermax can be sawed and nailed like wood.

Write for specification data and sample of material. Address Thermax Corporation, Dept. "A," 228 N. La Salle St., Chicago, Ill.

THERMAX
The Fireproofing Insulation

Many Projects Started

CONSPICUOUS in the building news of the past month has been the large number of reports of large scale residential buildings operations undertaken in all parts of the country, and particularly in the large metropolitan centers which always take the lead in recovery from slack building periods.

Arrangements have been made by The Kew Construction Company, to build 60 one-family houses at Forest Hills, Long Island, N. Y. The cost of the complete project is estimated to be in the neighborhood of $350,000.

At Gibson, Valley Stream, L. I., work has been started on 100 additional houses, by the Gibson Corporation. W. R. Gibson, president of the company, states that sales have been active during recent weeks.

Laurelton Homes, a development of English brick houses selling for $7,190, at Laurelton, L. I., N. Y., sold 176 homes in a period of eight weeks and the developers now have an additional 100 homes under construction.

In Chicago, Albert J. Schorsch has scheduled work to start on the first unit of his English village development which will provide 40 new homes to sell at $11,000 and $12,000.

Not all the work getting under way is of the residential type though this predominates. The building permit has recently been recorded for the $12,000,000,000 office building to be erected by the Marshall Field Estate, in Chicago's Loop District. This will have a 43-story central unit with two 22-story wings.

Work will start shortly on the Radio City, in New York, the great amusement center which will cover three city blocks, and which was described in the April issue of AMERICAN BUILDER AND BUILDING AGE.

Henry Mandel, who is now completing a $25,000,000 apartment development in New York City, has started a new project of similar proportions to be known as Chelsea Corners. It will consist of a group of buildings of uniform architectural conception ranging from 17 to 20 story high. Construction has already begun on the first five buildings and the whole group is to be completed in 1932, at an approximate cost of $20,000,000.

Favor Uniform Codes

RECOMMENDATIONS for the adoption of uniform building codes in all municipalities with a population of more than 10,000, and for the revision of existing codes along uniform lines, with a reclassification of buildings for insurance purposes, will be taken up by the executive board of the Associated General Contractors of America, at its spring meeting to be held in Washington, D.C., May 8 and 9.

To Combat Foreclosure "Racket"

A COMMITTEE, headed by Henry G. Zander, has been appointed by the Chicago Real Estate Board to call a joint session of realtors, bankers, and attorneys, to formulate a plan to combat the present foreclosure "racket" which is a serious obstacle to reorganization of real estate financing on a sound basis which will facilitate new construction. The appointment of this committee was the direct result of a speech before the Chicago Real Estate Board in which Judge Feinberg criticized the banks for failure to refinance small homes when mortgages came due and could not be paid, and a group of attorneys who force foreclosures under such circumstances.

Judge Feinberg predicted that, if the real estate board, the bar association and the banking interests would cooperate, the present foreclosure epidemic could be stopped within 30 to 90 days.

Revere Office Moved

THE executive, general sales, and advertising departments of Revere Copper and Brass Incorporated are now located in the New York Central Bldg., 230 Park Ave., New York City, instead of at Rome, N. Y. The officers of the company who will now make New York their headquarters are C. Donald Dallas, president; George F. Stanton, vice president and general sales manager; and J. A. Doucett, vice president and assistant general sales manager. The officers of the treasurer and the general accounting department will remain in Rome.

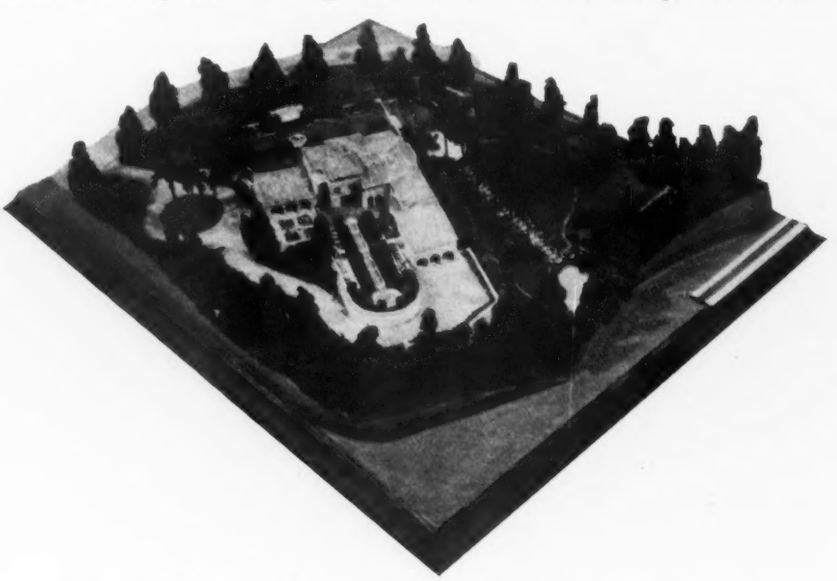
Make Models of Soap

McKOWN and Kuehl, landscape architects and town planners, of Beverly Hills, Cal., adopted a method of making architectural and landscape models which suggests possibilities for builders and designers who are faced with the necessity of producing miniature models conveniently and at reasonable cost. White soap is the medium used. Describing a house and grounds recently modeled in soap, Russell L. McKown said:

"The house, which has about thirty-five rooms, was made entirely of the large size cakes of Ivory soap. Most of the gardens were also carved out of this soap as were all of the garden walls. We found the soap to be an excellent medium to work with and much better than clay. We are better able to carve small details of wall balustrades, steps and fountain details, than we could have done with clay.

"Then we found that the soap would take color very readily and so were able to make the walls of the house the proper color, as well as the red tile roof, and the door and window openings. We also colored portions of the lawn where we had used soap to carve out the gardens and found it took the green very well.

"In all we used about ten cakes of soap and were able to make one cake stick to the next by holding them both under warm water and then rubbing them together slightly. In some instances we used toothpicks for dowels."



In Making Models, McKown & Kuehl, Landscape Architects and Town Planners, Have Found That Cakes of Soap Are Easily Carved and Colored.

BUILDERS do not readily accept a new material, untried and untested in practical application and experience. Yet, builders are giving Bi-Flax an acceptance as complete as it is instantaneous.

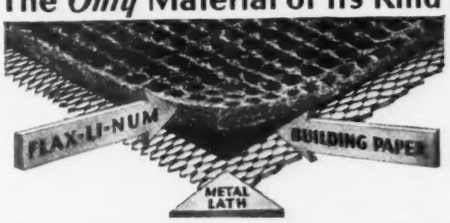
Back of this remarkable acceptance of Bi-Flax are years of experimenting—of testing materials—of laboratory work. Bi-Flax was not offered to the building industry until it represented the highest possible standard of efficiency. Today you see Bi-Flax as a new material, but one in which three high quality time proven materials are combined to make a new, more efficient insulating plaster base combined into one unit for economical application.

Flax-li-num insulation, used for more than twenty years when high insulating value is demanded—waterproof building paper, tested to hold water without leakage for fourteen days, and flat expanded painted metal lath, shown by analysis of all metal lath manufactured to have the greatest economical efficiency.

Bi-Flax has created a new standard in insulating plaster base materials. It offers you an opportunity to build new quality and greater efficiency into your construction work. See and examine this new material—the only one of its kind.

Write for a sample today. Just address, Flax-li-num Insulating Company, St. Paul, Minnesota.

BI-FLAX
The *Only* Material of It's Kind



List Twenty-five Biggest Cities

ACCORDING to the recent census of the United States, there are 94 cities of more than 100,000 population. The first twenty-five cities are listed below. Each has more than 300,000 inhabitants, their grand total being over 25 million, with a gain since 1920 of more than four million six hundred thousand, an average increase exceeding 22 per cent in the ten years.

One of these first twenty-five cities, Los Angeles, Cal., shows nearly 114 per cent increase, while the last one in the list of twenty-five is Boston, Mass., with a little more than five per cent. gain.

The statement following is self-explanatory. Cities of less than 300,000, but over 200,000 in the last census, are noted consecutively and placed following the first lot of twenty-five, without reference to the 1920 census, nor percentage of gain.

Our First Twenty-five Cities

	1930	1920
New York, N. Y. (Brooklyn, 2,604,549)	6,981,927	5,620,048
Chicago, Ill.	3,375,329	2,701,705
Philadelphia, Pa.	1,946,430	1,823,779
Detroit, Mich.	1,573,985	993,678
Los Angeles, Cal.	1,233,561	576,673
Cleveland, Ohio	900,430	796,841
St. Louis, Mo.	822,032	772,897
Baltimore, Md.	805,753	733,826
Boston, Mass.	787,271	748,060
Pittsburgh, Pa.	669,742	588,343
San Francisco, Cal.	637,212	506,676
Buffalo, N. Y.	573,070	506,775
Milwaukee, Wis.	572,557	457,147
Washington, D. C.	486,869	437,571
Minneapolis, Minn.	464,753	380,582
New Orleans, La.	455,792	387,219
Cincinnati, O.	449,331	401,247
Newark, N. J.	442,842	414,524
Kansas City, Mo.	399,484	324,410
Seattle, Wash.	365,518	315,312
Indianapolis, Ind.	364,073	314,194
Rochester, N. Y.	325,019	295,750
Jersey City, N. J.	315,642	298,103
Louisville, Ky.	307,808	234,891
Portland, Ore.	301,890	258,288
Totals	25,576,320	20,888,539

Cities Between 300,000 and 200,000

	1930
Toledo, O.	290,803
Houston, Texas	289,579
Columbus, O.	289,056
Denver, Colo.	287,644
Oakland, Cal.	284,213
St. Paul, Minn.	271,418
Atlanta, Ga.	270,367
Dallas, Texas	260,397
Birmingham, Ala.	257,657
San Antonio, Texas	254,562
Akron, O.	253,653
Providence, R. I.	252,386
Memphis, Tenn.	252,049
Omaha, Neb.	214,175
Syracuse, N. Y.	207,007
Dayton, O.	200,225

Expect Tax Relief

TAX relief for home and property owners, who have borne too large a proportion of the tax burden, is expected through new income tax laws, and amendments to existing income tax laws, according to the National Association of Real Estate Boards. Such legislation is progressing favorably in 14 states at the present time, it is reported.

Three states have already enacted new income tax laws, new laws or amendments favorable to realty have passed both the house and senate in six other states, and have passed the house in four states. New laws and amendments have been defeated, so far, in five states, rejected by the senate in two states, and withdrawn in one state.

Will Sell Primed Siding

ANNOUNCEMENT has recently been made of the introduction of Meta-Kote, ready primed siding, by the Mauk Lumber Company, Toledo, Ohio. This siding is sold, ready-primed with a coat of aluminum paint which protects it against change in moisture content.

Back Issue Wanted

THE New York Public Library is in need of a copy of the "Building Age" of June, 1919, in order to complete its file. Director E. H. Anderson, Fifth Ave. and 42nd St., New York City, would greatly appreciate receiving a copy of this issue from some reader who no longer needs it and would be willing to donate it to the library.

Merger Announced

SARGENT & COMPANY has announced a merger which has been completed between it and The Belleville Hardware and Lock Manufacturing Co.,-Limited, of Belleville, Ontario. The new company will be known as Belleville-Sargent and Company, Limited, and will continue to occupy the premises and carry out the policies of the two companies.

Launch Payment Plan

THE Norge Corporation, of Detroit, Mich., a subsidiary of the Borg-Warner Corporation, has recently launched a nation-wide deferred payment plan. This plan was adopted to aid the company's distributors in giving the public an installment plan which relieves dealers of the responsibility of financing refrigerator sales.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of American Builder and Building Age, published monthly at Chicago, Ill., for April, 1931.

State of Illinois, County of Cook, } ss.

Before me, a notary public in and for the State and county aforesaid, personally appeared Bernard L. Johnson, who, having been duly sworn according to law, deposes and says that he is the editor of the American Builder and Building Age, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, American Builder Publishing Corp., 105 West Adams St., Chicago, Ill.;

Editor, Bernard L. Johnson, 105 West Adams St., Chicago, Ill.;

Managing Editor, Joseph B. Mason, 105 West Adams St., Chicago, Ill.;

Business Manager, Robert H. Morris, 105 West Adams St., Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) American Builder Publishing Corporation, 105 West Adams St., Chicago, Ill., and Simmons-Boardman Publishing Corporation, 30 Church St., New York, N. Y. Stockholders of 1 per cent or more of the total amount of stock are: E. A. Simmons, 30 Church St., New York, N. Y.; I. R. Simmons, 1625 Ditmas Ave., Brooklyn, N. Y.; P. A. Lee, Hopatcong, N. J.; H. Anderson, 246 Rugby Rd., Brooklyn, N. Y.; E. G. Wright, 398 N. Walnut St., E. Orange, N. J.; S. O. Dunn, 105 West Adams St., Chicago, Ill.; C. E. Dunn, 3500 Sheridan Road, Chicago, Ill.; B. L. Johnson, 105 West Adams St., Chicago, Ill.; W. A. Radford, 407 So. Dearborn St., Chicago, Ill.; L. B. Sherman, 375 Sheridan Rd., Winnetka, Ill.; Mae E. Howson, 105 West Adams St., Chicago, Ill.; F. H. Thompson, Terminal Tower, Cleveland, Ohio; Spencer Trask & Company, 25 Broad St., New York, N. Y.; Partners of Spencer Trask & Company are: E. M. Buckley, Acosta Nichols, Cecil Barret, J. Graham Parsons, C. Everett Bacon, William H. Basset, F. Malbone Blodget, Percival Gilbert, Harry S. Allen, Harry A. Minton, William Beckers, W. V. C. Ruxton, all of 25 Broad St., New York, N. Y.; Arthur H. Gilbert, 308 La Salle St., Chicago, Ill.; S. Wallace Roe, 253 State St., Albany, N. Y.; William E. Stanwood, 50 Congress St., Boston, Mass., John Nightingale, 50 Congress St., Boston, Mass.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholders or security holders appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

BERNARD L. JOHNSON

Sworn to and subscribed before me this 25th day of March, 1931.

HELEN E. PITMAN

(My commission expires Feb. 3, 1932.)

Put this RU-BER-OID ADVERTISING to work

THROUGH RU-BER-OID advertising, we are reminding millions of property owners of the economical way to re-roof. By personal follow-up you can convert their roofing interest into profitable roofing jobs.

Bad roofs keep no secrets. Their appearance provides a re-roofing list long before they go wrong. So make up your prospect list now.

Your RU-BER-OID dealer will gladly supply you with samples of the full line of RU-BER-OID Asphalt and Asbestos Shingles—also selling helps that are colorful and convincing.

All you have to do is to hand the RU-BER-OID dealer your list of prospects and these selling helps start to work in your interests immediately.

See and talk with the RU-BER-OID dealer today. There is money in the re-roofing business for you both.

RECTANGULAR STRIPS AND UNITS

1 6 weights—6 prices—8 artistic colors—2 color blends—a wide choice providing multiple thicknesses of fire-resistant roof protection.

HEX-STRIP SHINGLES

2 4 weights—4 prices—8 beautiful colors—2 mixtones. Butts cast heavy shadow lines. Fire-resistant.

ASBESTOS SHINGLES

3 3 weights—6 colors of permanent beauty—4 color blends—3 styles—Hexagonal, Horizontal and Tapered American. Fireproof.

The RUBEROID Co.

ROOFING MANUFACTURERS FOR OVER FORTY YEARS

Sales Divisions: RUBEROID MILLS
CONTINENTAL ROOFING MILLS—SAFEPACK MILLS
H. F. WATSON MILLS—ETERNIT

ASPHALT SHINGLES AND ROLL ROOFINGS—ASBESTOS-CEMENT SHINGLES AND CORRUGATED SHEETS—ASBESTOS, ASPHALT, COAL TAR PITCH AND FELT BUILT-UP ROOFS—ASBESTOS: SHEATHINGS, FELTS, MILL BOARD, PIPE COVERINGS—KRAFT WATERPROOF PAPERS—COAL TAR AND ASPHALT FELTS AND SHEATHINGS—ASPHALT WATERPROOFING PAINTS AND CEMENTS—DRY FELTS AND SHEATHINGS.

Offices & Factories: New York, N. Y.—Chicago, Ill. Millis, Mass.—Erie, Pa.—Baltimore, Md.—Mobile, Ala.

Practical Job Pointers

A Readers' Exchange of Tested Ideas and Methods, Taken from Their Own Building Experience. Two Dollars Will Be Paid for Each Contribution Published in This Department

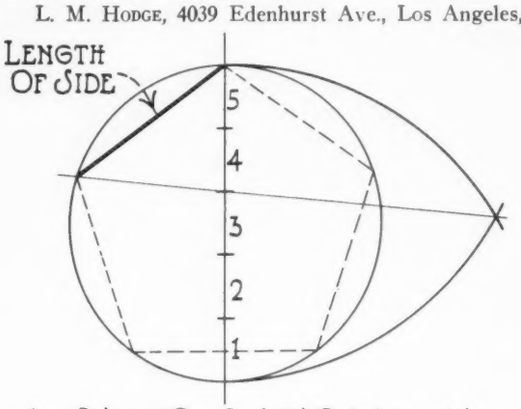
To Lay Out a Polygon

I HAVE often seen mechanics, when they had to lay out polygons, puzzled to get the side accurate, so will offer the following method of laying out polygons, which is not only simple, but accurate if carefully done.

First strike a circle of sufficient size to enclose the desired polygon. Divide its diameter into as many equal spaces as the polygon has corners. With the intersection of each end of the diameter with the circle as centers and with the diameter as a radius, strike two arcs, letting them intersect outside the circle.

From this intersection of the arcs draw a straight line through the second division point on the diameter until it cuts the opposite side of the circle. From this point, a line drawn to the intersection of the diameter with the circle gives the length of the desired side.

L. M. HODGE, 4039 Edenhurst Ave., Los Angeles, Cal.



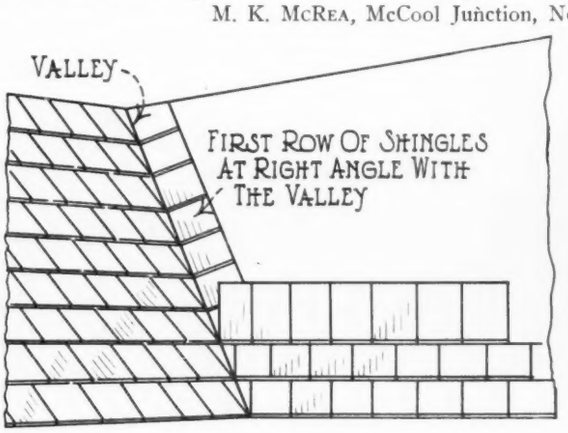
Any Polygon Can Be Laid Out Accurately by This Method If It Is Done Carefully.

Shingling a Valley

THE sketch shows my method of shingling a valley without sawing more than three shingles. I first lay a row of shingles at right angles with the valley, all the way up. I always pick out the wide shingles for this as they make fewer joints.

Next take the first shingle of the regular double row and saw it to fit against the first shingle to the valley. Then lay the double row clear across the roof, letting the corner of each row following extend out to the valley.

M. K. MCREA, McCool Junction, Neb.



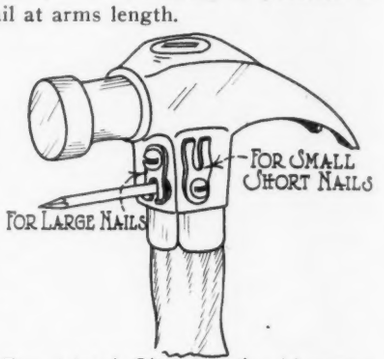
You Can Save Cutting Shingles by Using This Method of Shingling the Valley.

Nail Holder on Hammer

OFTEN when a job of nailing is to be done an attachment, such as shown in the sketch, which I have made for my hammer, comes in handy. By placing the nail in the clip as shown, it is like having an extra hand to work with, making it possible to nail at arms length.

The nail is held firmly in the clip, in the correct position to start it with one blow. Then the hammer is pulled releasing the nail from the clip. You can then go ahead and drive the nail.

The sketch shows clearly how the clip is made and attached. All hammers are soft enough to permit easy drilling for attaching the clips which are held in place with screws. The clips are made from pieces of annealed clock spring.



Two Metal Clips on the Hammer Are Handy for Overhead Nailing.

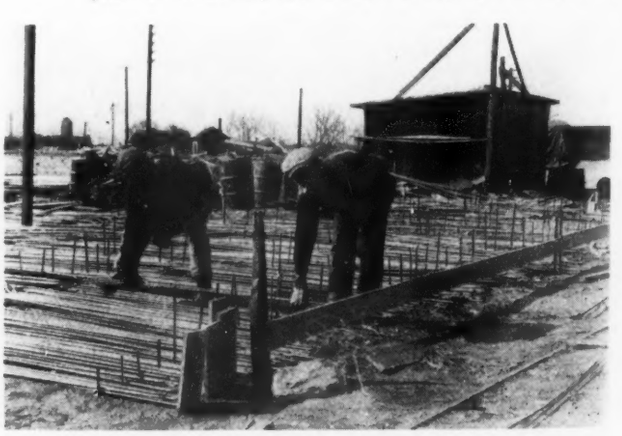
CHARLES H. WILLEY, Box 73, Concord, N. H.

Storing Reinforcing Steel

WHERE much reinforcing steel is being used on a construction job, it will pay to use a system for segregating the various sizes, kinds and lengths, so that any laborer can select the material he is told to get without delay. The system illustrated here is a good one.

The reinforcing steel is laid in neat piles on the ground, the different sizes, kinds and lengths are separated by short pieces of rod driven into the ground. At one end of the rows of material, a long board is nailed to stakes driven into the ground. Opposite each pile of steel, the size length and other descriptive information about the material is marked on the board. When looking for certain material a glance at the board tells where to find it. An experienced workman attends to the sorting and piling of material.

JOSEPH C. COYLE, 538 Santa Fe Drive, Denver, Colo.



If Reinforcing Steel Is Segregated and Marked as Shown Here It Is Quickly Located When Wanted.

IT HANGS TOGETHER

Here you see one of the reasons why Brixment mortar cuts bricklaying costs—*the mortar hangs together.* . . It doesn't break off and fall to the ground before the joint is struck. As a result, no mortar is wasted and the bricklayer stoops less often to the mortar board. It doesn't slop down over the face of the wall. So less time is required to clean down the finished job. . . This is due to the fact that the plasticity of Brixment mortar does not depend upon the use of excessive water. . . *The mortar hangs together.*

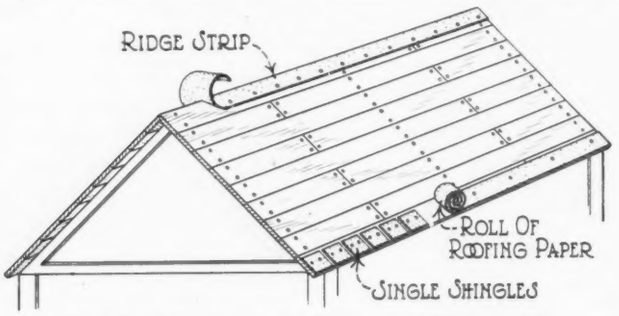
LOUISVILLE CEMENT COMPANY, *Incorporated,* LOUISVILLE, KY.
District Sales Offices: 1610 Builders Bldg., *Chicago;* 600 Murphy Bldg., *Detroit;* 101 Park Ave., *New York*
Mills: Brixment, N. Y. and Speed, Ind.

BRIXMENT

A Cement for Masonry and Stucco

When Laying Asphalt Shingles

INSTEAD of laying the first row of asphalt shingles along the edge of the roof, in the usual way, I lay a strip of similar roll roofing first, as shown in the sketch. This gets the roofing started more quickly and with less nailing as the roll requires a few nails only. The second layer of regular shingles, is sufficiently nailed to hold the



Roll Roofing Used at Eaves and Ridge with Asphalt Shingles Save Time and Makes a Better Job. Sketch shows comparison.

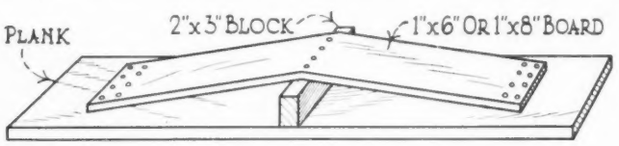
roll material in place. Since the usual first layer of shingles is entirely covered by the second layer, there is no apparent difference in the roof. The roll roofing is cut to the width of the shingles being used.

In finishing the ridge I again use a piece of roll roofing as shown in the sketch. This is not only quicker than laying single shingles, but it reduces the chance of a strong wind getting underneath and raising the roofing. With single shingles, sometimes some of the nails fail to catch in solid wood with the result that these shingles may raise and cause leakes.

JOSEPH J. ZAR, Oliphant, Pa.

Strengthening Scaffold Planks

I HAVE learned, from experience, a good way of strengthening scaffold planks that may be too weak for safety. Nail a 2 x 3-inch block at the center of the plank, across its width. Then take a piece of 1 x 6, or 1 x 8-inch board a little shorter than the length of the plank, bend it over the block and nail to the block and plank as shown in



A Weak Scaffold Plank Braced Like This Is Perfectly Safe But Should Be Tested Before Using.

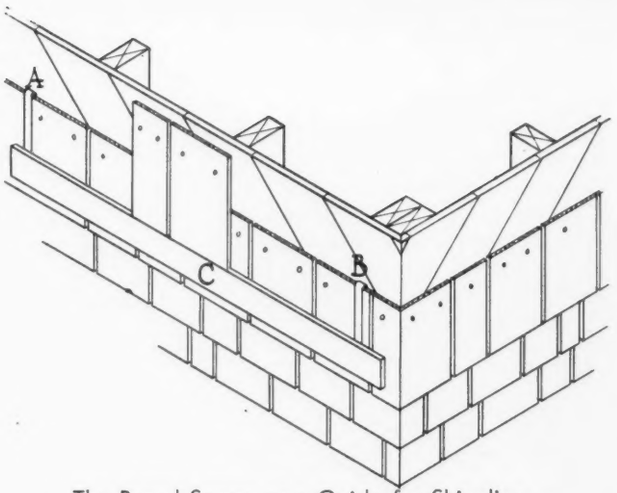
the sketch. In use, this brace is on the under side of the plank, which is used in the reverse of the position shown in the sketch. After bracing, the strength of the plank can be tested by placing a low support under it at each end, and jumping on it.

N. O. FAGERSTROM, 150 Ninth St., San Francisco, Cal.

This Simplifies Laying Shingles

SHINGLE laying is made easy by the use of the device shown in the sketch. This device can be made in a few minutes. All that is required is a straight board, of any size, though a light piece is easiest to handle, and two pieces of strap iron. The pieces of strap iron are bent at one end in the form of a hook. The opposite end is fastened at right angles to the board.

The hooked ends of the pieces of strap iron are hooked over the last row of shingles. Their length is such that the upper edge of the board is the exact distance from the



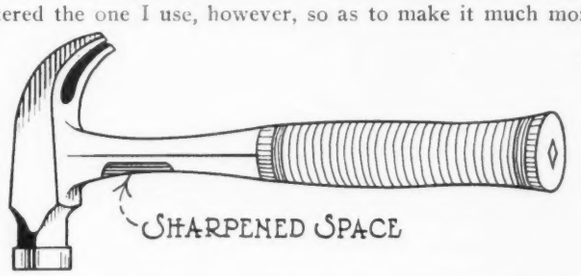
The Board Serves as a Guide for Shingling.

butts of the last row as the exposure desired. The shingles are simply laid on the board and nailed. The exposure can be varied by varying the length of the hooks.

WILLIAM FOIT, 2213 S. Gunderson Ave., Berwyn, Ill.

Improving an All Steel Hammer

THERE is an all steel hammer now on the market which is, in my opinion, the best hammer obtainable. I have altered the one I use, however, so as to make it much more

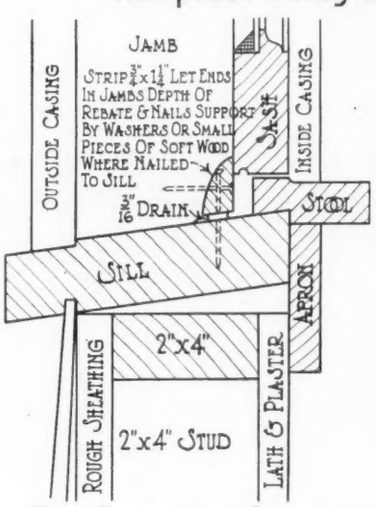


Sharpened as Shown This Hammer is a Handy Tool to Use When Applying Wood Shingles.

useful than it was when I originally bought it. I worked down a space about 1¾ inches long, along the neck of the handle and sharpened it to a good edge. With this improvement the hammer serves the purpose of an ax or hatchet and is especially handy in applying wood shingles. It holds the edge very well.

WM. YOUNG, R. F. D. No. 3, Pontiac, Mich.

Rainproof Swing Casements



This Construction Prevents Leakage Around Casements.

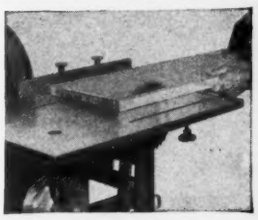
THE sketch shows a method of construction for a swing in casement which will not leak. It is so simple that it hardly requires explanation. The ¾ by 1¼-inch, quarter round strip prevents all leakage but, being set up from the sill, permits water to drain off.

C. L. SNYDER, Box 293, Peru, Ind.

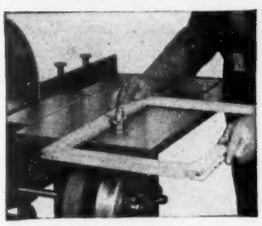
Slack Time Profits!

SEVEN MACHINES IN ONE

1. Saw Table
8" circular saw. Ripping, cross cutting, etc.



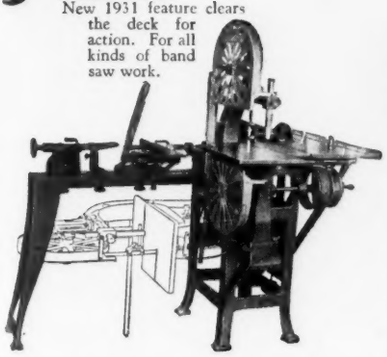
2. Shaper
Vertical, reversible. For mouldings, trim, etc.



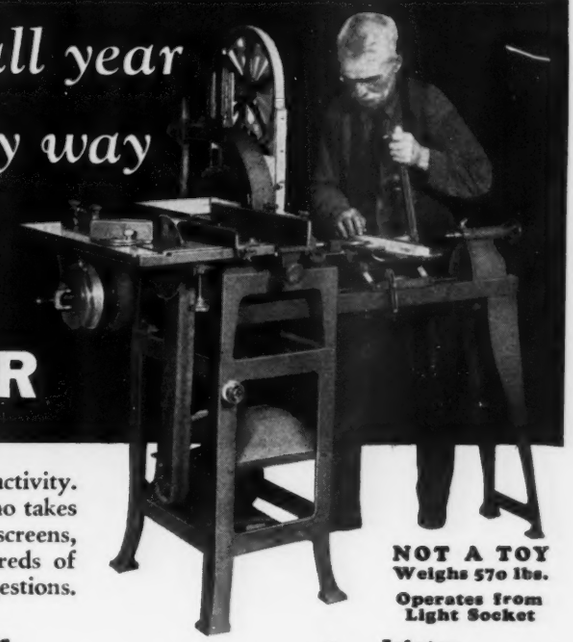
3. Speed Spindle
For disc sanding, tool grinding, polishing, etc.

4. Mortiser
½" hollow chisel, high speed, accurate.

5. Fold Over Band Saw
New 1931 feature clears the deck for action. For all kinds of band saw work.



Make money all year round this easy way with the ELECTRIC CARPENTER



NOT A TOY
Weighs 570 lbs.
Operates from Light Socket

Don't wait for the return of building activity. Big profits are waiting for the man who takes advantage of conditions. Makes screens, trellises, furniture of all kinds, hundreds of other salable articles. Write us for suggestions.

Carpenters, Cabinet Makers Start in Business for Yourself

You will never earn real money until you are independent—your own boss. Here is the chance of a lifetime for carpenters, handy men, employees of planing mills and lumber yards—anyone who has worked in wood. *Start in spare time—in your basement or garage.* The Electric Carpenter will enable you to provide your family with the better things in life.

Contractors, Builders Big Profits in Dull Times

You can make and sell porch enclosures, built in cabinet work, etc. *One original idea may net you a fortune.* One builder keeps three men busy making modernistic furniture.

SUBSTANTIAL PROFITS

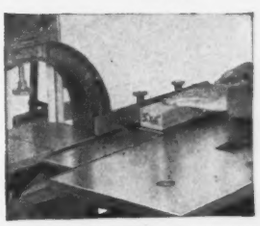
If you already have a shop established, the Electric Carpenter is guaranteed to increase your production and cut costs. It will do any woodworking job and will pay for itself in a few months.

YOU CAN MAKE and SELL

Screens,
Sash,
Furniture,
Trellises,
Toys,
Novelties,
Built in Kitchen Conveniences,
Cabinets,
Corner Cupboards,
Book Cases,
Desks, etc.

Work which costs $50 at the planing mill can be done on the Electric Carpenter in a day.

6. Jointer
Six inch, for all joint surfaces.



7. Lathe
36" with 10" swing. 3 speeds.

A WHOLE YEAR TO PAY

A moderate deposit brings your Electric Carpenter at once. Convenient monthly payments enable you to make it pay for itself. Don't hesitate to buy a machine which quickly brings back more money than you invest in it.

Send this coupon today for full information.

The AMERICAN FLOOR SURFACING MACHINE COMPANY

509 South St. Clair Street, Toledo, Ohio

Please send me illustrated folder showing how I can make slack time profits with the Electric Carpenter.

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☐ Builder
☐ Carpenter
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Name .....
Address .....
City ..... State.....

THE ELECTRIC CARPENTER IS A COMPLETE PLANING MILL—DOES 35 WOODWORKING OPERATIONS

Builder and Dealer Relations

How Two Very Important Factors In Building Field Operations Co-operate to Mutual Advantages

by

E. L. GILBERT
Research Director, American Builder and Building Age

THE builder and the dealer are two of the most important factors in all building construction, both as regards the successful execution of the work and also in the matter of merchandising building products so that they will be actually used in the greatest possible number of cases. Without dealer distribution no building field product can enjoy maximum sales; unless builders accept the products it is useless for dealers to stock them.

During the last ten years builders have motorized their businesses; today they are traveling 30 to 50 miles daily to jobs which a few years ago would have been considered beyond their economic operating range. Farm building construction offers a good example of this development, for it is only a short time, comparatively speaking, since the mechanics boarded at the farmhouse from Monday morning until Saturday night; now the builders and their mechanics drive their cars 10, 20 or even 30 miles morning and night.

Within the same period of time dealers have become accustomed to make longer and longer hauls of materials, with the consequence that dealers are now able to cover two or three times as much territory as previously. Although this has enabled the average dealer to reach a greater number of builders, it has brought competition from other dealers in nearby towns and cities. Also, builders now have a greater "local buying area" because of their ability to travel farther for the products they want.

A recent survey was conducted by the Research and Marketing Division of AMERICAN BUILDER AND BUILDING AGE to determine how many different lumber dealers served each builder. The replies represented some 41 states and came from builders whose annual business volume ranged from less than $50,000 to several millions. A summary of the replies is interesting.

NUMBER OF DEALERS SERVING EACH BUILDER

Replies	Per Cent of Builders
"ONE Dealer"	25.2
"TWO Dealers"	22.9
"THREE Dealers"	18.2
Four or more Dealers	33.7

Further investigations revealed the fact that buying from a number of different dealers was not necessarily due to efforts to secure lower prices. In fact, many demands for specific materials, equipment and specialties develop suddenly, especially in the residential field. If a builder is absolutely convinced that one particular brand of product will best meet his requirements—a conviction usually based upon that individual builder's experience or knowledge of the specific product—that builder will search painstakingly throughout his "local buying area" for the particular brand he wants. Ninety-five per cent of the builders interviewed answered "Yes" to the question: "Will Dealers carry in stock the products you want?"

Since the primary function of the dealer in building products is to provide the desired products at the point of construction at the exact time required, the builder has found it most effective to buy his materials locally. Demands for certain branded products on the part of builders may be most effectively developed through advertising in building field publications, direct mail addressed to the builders' homes, the efforts of salesmen in the field, and by locating one or more installations or samples within each "local buying area". It is very important to let the builder know that he can secure a product from his local dealer, or that he can arrange for his favorite dealer to carry the desired product in stock.

That builders in the majority prefer to buy from local sources is indicated by the following summary of replies from hundreds of builders to the question: "Do you prefer to buy from manufacturers—direct, or from local dealers?"

BUILDERS' PREFERENCES IN PURCHASING

Replies	Per Cent of Builders
"From local concerns"	64.7
"Both"	15.3
"Manufacturers if possible"	15.3
Indefinite	4.7

It has also been proved that the majority of builders are not particularly interested in carrying their own stocks of materials, or to act as lumber and supply dealers. Occasionally some new product obtains a certain amount of distribution to builders direct, especially in the case of specialties; this kind of distribution for manufacturers has been secured by advertising direct to the builders, making special price concessions on the first sample (or sending a free sample), then following up with a good agency proposition. But in many cases the builders buy the product for their own work only, as they find it a little difficult to sell to competitors in their own sections.

The average lumber dealer has added many items to his stock in recent years so that now he offers a service the merit of which is readily recognized by most of the 160,000 contractors and builders in this country. A sound basis of operation, cemented by frequent friendly meetings, makes the co-operation of builder and dealer a byword throughout the industry. The extent to which builders rely on lumber dealers for other materials is evidenced by a survey which was prepared a short time ago for the National Lumber Manufacturers Association. The degree to which various other materials (than lumber) have secured distribution through lumber dealers is clearly shown by the find-

(Continued to page 126)

18 Years of Reliable Service Behind— Prolonged Years of Even Finer Service Ahead

Commercial transportation standards are invariably set by Reo.

Eighteen years ago, Reo first introduced light, more-power-for-weight, speedier, safer, lower-cost SPEED WAGONS, and has maintained engineering dominance ever since.

Hundreds of thousands of REO SPEED WAGONS and TRUCKS have been placed in operation in 64 countries, hauling structural steel down congested Broadway, bringing Brazilian coffee to coastal shipping ports, or patrolling the vast desert stretches along the Great Wall of China!

The same story of day-in-day-out reliability and astounding infrequency of repair has travelled the world around, and has won universal acceptance for REO products.

In face of these irrefutable results, the REO is deserving of a lasting place in your system of transportation service.

REO MOTOR CAR COMPANY, LANSING, MICHIGAN

SPEED WAGONS REO AND TRUCKS

Questions of Law Clearly Answered

Legal Rulings of Interest to All Builders

By LESLIE CHILDS

WHERE a contractor works under plans and specifications furnished by an owner, he cannot, in the absence of a special agreement covering the point, be held liable for an unfortunate result. In such a situation, when the contractor has followed the plans and specifications furnished, he will be deemed to have complied with his contract whether the completed work satisfies the owner or not.

And further, the usual phrases found in construction contracts, that obligate a contractor for responsibility for prosecution of work, may not be construed as making the contractor a guarantor of the sufficiency of the plans and specifications. A nice point this, and as an illustration of judicial reasoning thereon the following will serve.

Owner Furnishes Plans and Specifications

Here, a contractor undertook to perform certain work, which included the erection of a bulkhead on boggy ground, which was intended to withstand a certain pressure from water when completed. The owner furnished the plans and specifications which were drawn by his architect, and the contract stipulated that the work was to be done in accordance therewith. The contract also contained the following provision:

"Contractor must visit the premises and satisfy himself as to local conditions and assume all responsibility for the same in connection with the prosecution of the work".

The contractor began work under this contract, and was paid from time to time upon the architect's certificate as the work progressed. The work was done under the supervision of the owner's architect, and upon completion the latter issued his final certificate for about $30,000, which represented the final payment.

However, before this was paid it was discovered that the bulkhead was bulging, and it required a further expenditure of $24,000 in way of reinforcement which was paid by the owner. In the face of this unhappy result, the owner declined to make final payment to the contractor, and sought to charge the extra expense against him.

In reply to this, the contractor contended that as he had followed the plans and specifications furnished him, as his contract required, he was in no way responsible for the result. Further, he pointed to the facts in the case which indicated that the reason for the bulging was because of defects in the plans and specifications, for which he was in no way responsible. The contractor thereupon filed suit.

Upon the trial of the case, the owner took the position that the provision of the contract, quoted heretofore, that required the contractor to visit the premises and take all responsibility for the prosecution of the work, obligated the latter. The trial court, however, found for the contractor, and on appeal the higher court in stating the general rule in cases of this kind quoted from another case as follows:

The General Rule Stated

"Where one agrees to do, for a fixed sum, a thing possible to be performed, he will not be excused or become entitled to additional compensation, because unforeseen difficulties are encountered. . . . Thus one who undertakes to erect a structure upon a particular site, assumes ordinarily a risk subsidence of the soil. . . . But if the contractor is bound to build according to plans and specifications prepared by the owner, the contractor will not be responsible for the consequences of defects in the plans and specifications. . . . This responsibility of the owner is not overcome by the usual clauses requiring builders to visit the site, to check the plans, and to inform themselves of the requirements of the work. . . ."

Following the foregoing statement of the general rule in cases of this kind, the court directed its attention to the application of the rule to the facts of the case. Here, the court said:

Damage Caused by Defective Plans

"The great preponderance of evidence is to the effect that the architect and superintendent of the owner supervised the work from its inception to its completion, that he examined the structure when completed, and accepted the same by certifying that the contractor was entitled to a final payment for the work done.

"From the evidence of the contractor it is clear that the bulkhead gave way because the work was not sufficiently heavy; that the fault lay in the plans and specifications. The owner contends that it gave way because of the negligence of the contractor in failing to observe the peculiar conditions of the soil, and in the negligent performance of the work. . . ."

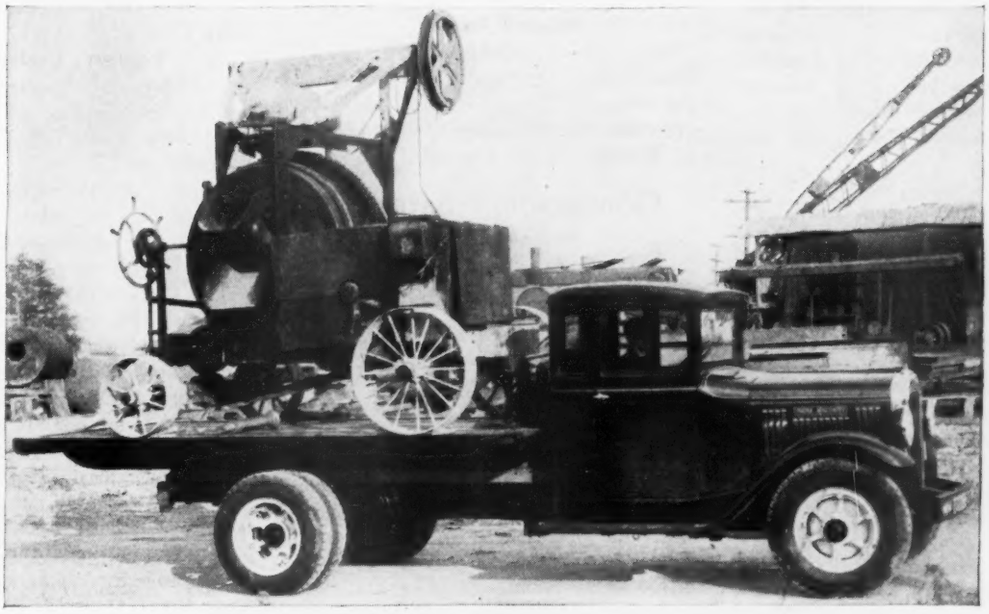
Then in passing upon the owner's contention, that the clause in the contract requiring the contractor to assume responsibility for the work made him liable for the result, the court continued.

"It is not provided that the contractor assumes all responsibility for the 'completion' of the work, but only in regard to the prosecution thereof; in other words, we think this provision had reference only to the character of the location, or site, whether wet or dry, stable or unstable, soil or rock, and imposes upon the contractor responsibilty for the amount of his construction bid and is not a warranty that a structure erected thereon will not collapse, even though erected according to the plans and specifications. . . ." (137 S. E. 485.)

In accordance with the foregoing line of reasoning, the court concluded by affirming the judgment of the trial court in favor of the contractor. Taking the position that, since the evidence showed that the contractor had performed the work in strict compliance with the plans and specifications, he had fulfilled his obligations under the contract. And that he could not be held liable for damage that resulted because of the defects in the plans and specifications furnished by the owner.

The holding in the foregoing case is in accord with the great weight of authority on the point involved, the courts quite uniformly holding that to make a contractor a guarantor of the sufficiency of plans and specifications, requires a special provision to that effect; that general clauses importing responsibility for the prosecution of work, may not be construed as making a contractor liable for results caused by following defective plans and specifications.

. . . . FOR BIG LOADS, HEAVY LOADS, YOU NEED HEAVY-DUTY TRUCKS



Dodge Trucks like this one are carrying capacity loads daily for contractors everywhere

For heavy-duty hauling in your industry you need trucks that will haul heavy loads. » » Dodge Heavy-Duty Trucks will do that. They are rugged in design and construction through and through. Everything about them says *heavy duty*. Everything about them says *power*, says *dependability*, says *long life at low cost*. » » Whatever your heavy-duty hauling needs may be . . . whether you must head up steep hills often or over unimproved roads daily . . . there is a Dodge Heavy-Duty Truck for your job. A Dodge Truck that's modern. That's precision-built throughout and correctly balanced part to part for longer life. A truck that's dependable. That's economical. That will work for you and earn for you as no other truck will do.

» » See your Dodge Brothers dealer. See and test the Dodge Heavy-Duty Truck that fits your needs. You can buy it complete with standard or special body. You will find it an exceptional value—a loyal worker, a consistent earner.

THE COMPLETE LINE OF DODGE TRUCKS RANGES IN PAYLOAD CAPACITIES FROM 1,200 TO 11,175 POUNDS—PRICED, CHASSIS F. O. B. DETROIT, FROM $435 TO $2695, INCLUDING THE 1½-TON CHASSIS AT . . . $595

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OPERATING RECORD BOOK FREE

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Send your Operating Record Book. I understand there is no obligation.
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DEPENDABLE DODGE TRUCKS

The Builder's Library

Equipment for Buildings

Gas Ranges

A new model "Magic Chief" gas range has been brought out by the American Stove Company, Lorain, Ohio, and is completely described and handsomely illustrated in colors in a new booklet published by this company.

Mechanical Refrigeration

"American Standard Safety Code for Mechanical Refrigeration," approved by the American Standards Association, has been published in booklet form by the American Society of Refrigeration Engineers, 29 W. 39th St., New York City.

Domestic Water Heaters

The Davis Engineering Corp., 90 West St., New York City, offers a folder describing its new Paracoil apartment house, domestic, water heater, of the U-tube type.

Plumbing Fixtures

"Hospital Plumbing Fixtures" is the title of simplified practice recommendation R106-30 of the U. S. Department of Commerce. Price 10 cents from the Superintendent of Documents, Washington, D. C.

Street Lighting Equipment

The Westinghouse Electric & Manufacturing Co., Cleveland Works, Edgewater Park, Cleveland, Ohio, has published two new catalogs. Catalog 218-A is entitled Westinghouse Utilitarian Street Lighting Equipment, and Catalog 218-B is entitled Westinghouse Ornamental Street Lighting Equipment.

Air Conditioning

"Conditioning the Air for Health and Comfort" is the title of a booklet catalog issued by The Lewis Corporation, 829 Second Ave., South, Minneapolis, Minn., covering the equipment it manufactures.

Unit Heaters

The Young Radiator Company, Racine, Wis., has recently issued a new catalog covering its unit heaters.

Contractors' Equipment

Engineering Instruments

A new catalog of engineering and surveying instruments has recently been published by Warren-Knight Co., 136 North 12th St., Philadelphia:

Electric Tools

The Unit Electric Tool Co., Inc., 302 W. Water St., Syracuse, N. Y., offers a catalog illustrating various electric tools which it makes, including complete door working tools.

Belt Conveyors

A folder illustrating its portable belt conveyors has been issued by the Fairfield Engineering Co., Marion, Ohio.

Check These Items Every Month and Write for Those You Need to Keep Your Files Up to Date. Any Item Listed Will Be Sent Free on Request Except Where a Price Is Noted. The American Builder and Building Age Should Be Mentioned When Writing for These Publications.

Industrial Tractors

"McCormick-Deering Industrial Tractors and Operating Equipment" is the title of a new catalog from the International Harvester Company, 606 S. Michigan Ave., Chicago.

Construction Materials

Linoleum Flooring

"Decorative Floors" in Armstrongs linoleum, linotile, and cork tile are presented in a new booklet published by the Armstrong Cork Company, Lancaster, Pa.

Concrete Work

"Concrete Facts for Concrete Contractors" is the title of a new booklet offered by the Portland Cement Association, 33 W. Grand Ave., Chicago. It deals with concrete making, colored concrete, surface finishes, forms, watertight concrete, and cold weather construction.

Log Siding for Cabins

"Log Cabins Up to Date Built with Shevlin Log Siding" is the title of a new booklet offered by Shevlin, Carpenter & Clarke Company, 900 First National-Soo Line Bldg., Minneapolis, Minn.

Insulating and Wall Boards

Cornell Wood Products Company, 307 N. Michigan Ave., Chicago, has issued a new pamphlet under the title "Now You Can Sell Cornell for the Complete Job!" showing the market for its wall board and insulating board.

Wood Windows

"Wood Windows for Factory Buildings" is Lumber Facts No. 22, a booklet published by the National Lumber Manufacturers Association, Washington, D. C.

Chain and Wire Equipment

A pocket size booklet listing the products of the American Chain Company, Inc., and its associated companies, has just been issued.

Mortar Colors

The Clinton Metallic Paint Co., Clinton, N. Y., offers the following new literature: "The Importance of the Color of Mortar in Architecture," "Color in Stucco," "Color Suggestions for Brickwork," and "Standard Specifications and Recommendations for Using Clinton Mortar Colors and Clinton Cement Colors."

Offered by Book Publishers

"Advertising Real Estate"

Here is a new book by Lloyd D. Herrold, professor of advertising at Northwestern University School of Commerce, which was prepared as a practical aid in the planning and preparing of advertising in this field. Published by the McGraw-Hill Book Company, Inc., 370 Seventh Ave., New York City.

"Engineer's Guide—1931"

The American Society of Heating and Ventilating Engineers, 51 Madison Ave., New York City, has published the 1931 edition of its annual Guide, which is a complete practical reference book of data on heating and ventilating practice. Price $5.

"The Autobiography of an Engineer"

This book by William LeRoy Emmet, contains, in addition to ordinary biographical material descriptions of the author's work as an engineer and inventor. It is published by the Fort Orange Press, 883-91 Broadway, Albany, N. Y. Price $2.

"Building Estimator's Reference Book"

The new, seventh edition of this well known reference book by Frank R. Walker, has just been published by the Frank R. Walker Company, 536 Lake Shore Drive, Chicago. Price $10, including the new edition of "The Vest Pocket Estimator."

Miscellaneous Publications

Log Construction

"The Use of Logs and Poles in Farm Construction" is the title of Farmers' Bulletin No. 1660, of the U. S. Department of Agriculture. It contains valuable information on log house construction. Price 10 cents, from the Supt. of Documents, Washington, D. C.

House Repairs

"Suggestions for Possible Repairs and Improvements in the House and Its Equipment" is a new U. S. Department of Commerce bulletin prepared for The President's Emergency Committee for Employment.

"Care and Repair of the House"

This is a U. S. Department of Commerce publication containing much practical and valuable information on this subject including minor repairs. Price 20 cents, from the Supt. of Documents, Washington, D. C.

"Garage Design Data"

Here is a booklet published by the Ramp Buildings Corporation, 21 E. 40th St., New York City, as a service to architects. It contains data valuable to anyone building public and parking garages of any type.

BUILD YOUR HOMES *in "Silent Town"*

for

QUICKER SALE *and* BETTER PRICE

Isn't it just plain good business to cash in on the rapidly growing demand for *thoroughly modern* homes . . . the public preference for oil heating . . . and for Silent Automatic? Investing in "Silent" is certain to increase the selling price of the homes you build . . . and pay you lasting dividends in satisfied customers.

*Scores of builders testify to this truth. A promient builder of Drexel Hill, Pa., tells us: "All of our clients are thoroughly satisfied with the even, steady, clean, quiet and dependable heat of the Silent Automatic oil burner."

Another, in Detroit, Mich., says: "I have found Silent Automatic to be the best oil burner. By 'best' I mean the most dependable, economical and, in all ways, the most satisfactory burner among the several makes I have tried."

One builder in Watertown, Mass., has installed 20 "Silents". Another in Philadelphia, Pa., installed 16 "Silents" in a solid block of homes. We can cite instances of 20, 30 and even more installations by a single builder.

Does not such testimony suggest to you: Get the *facts* about Silent Automatic home-heating . . . *today?*

SILENT AUTOMATIC CORPORATION
12001 E. Jefferson Ave., Detroit, Mich.

For Warm Air, Steam and Hot Water Heating Systems—Old or New Homes

**Names of builders quoted here . . . and of many others who prefer "Silent" . . . will be supplied on request.*

SILENT AUTOMATIC

THE NOISELESS OIL BURNER

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Made by the World's Largest Producer of Domestic Oil Burners

MEMBER OIL HEATING INSTITUTE OIL HEAT AS CONVENIENT AS SUNSHINE

All Silent Automatic models listed as standard by Underwriters' Laboratories

COUPON

Yes, I want to know how Silent Automatic can increase the selling price of my homes.

Name_____
Firm Name_____
Address_____
City_____ State_____

Builder and Dealer Relations

(Continued from page 120)

ings in this investigation. The survey covered many of the most important dealers throughout the country.

RANGE OF PRODUCTS SOLD BY LUMBER DEALERS

Product	Per Cent of Lumber Dealers Handling
Roofing materials (except shingles)	79
Composition wall board	75
Composition shingles	63
Cement	55
Plaster	51
Builder's hardware	42
Paint	40
Brick	31
Tile (Floor and Wall)	31
Building tile	28
Steel sash	28
Glass	28
Composition flooring	13
Wall paper	10

The fabulous profits credited to both dealers and builders by the general public will be found, upon investigation, to consist of dividends usually not exceeding a reasonable percentage against capital invested. If a builder can secure from seven to ten per cent on his capital investment over a period of a year he is usually satisfied. And it is well known that the "generous discounts" offered to dealers must be viewed with the thought in mind that the average dealer spends from twelve to seventeeen per cent of the money he takes in, just for operating expenses. Both dealers and builders make profits in direct proportion to the degree of skill with which they are able to manage their businesses.

Incidentally, there has been some report of dealers becoming builders, and also of builders becoming dealers. At the outside count, there are some 30,000 dealers of lumber and builders supplies. In a normal year our national building program includes about 1,200,000 projects and it has been conservatively estimated that not less than 160,000 contractors and builders are needed for this great volume of work. If all the dealers in the country turned builders overnight, probably an equal number of builders would see opportunities in the dealer business, which would simply result in an exchange in personnel. But if such a wholesale exchange should take place it is safe to estimate that there would be many thousands of failures, for each of these building field professionals is trained to look at building activity from a different angle, with but partial cognizance of the numerous troubles to be so easily encountered on the other side of the fence.

By working together dealer and builder are able to solve many common problems with mutual profit. Advertising to induce the local public to spend money for building, co-operative attention to the financing of home building, development of a strong market for modernization, agreement upon the reasonable number of brands to be used in all work—these are all good examples of builder-dealer co-operation which has paid fine dividends to both.

Success in Handling Men Made This Business Grow

(Continued from page 71)

The city's growth in the past ten years has resulted in about doubling the population, so that today, with its metropolitan area, it is around 45,000. There are many beautiful homes scattered around the valley, which is on a plateau of about twenty-four hundred feet elevation and surrounded by many mountains. Much of our recent business has been the building of homes in these outlying regions.

Favorable real estate conditions in this rapidly growing town make possible a profit in land as well as construction, and at the same time enable us to sell the house and lot at a low figure. We buy several hundred lots at advantageous prices and are constantly in the market for good building lots. As an example, recently we purchased eight lots which were cut so as to make nine building sites. We put our force of men in to the construction of seven houses simultaneously. By having all the men on the ground, and with quantity hauling of material, we were able to produce these houses at low cost. We charged these lots up to the jobs at a little less than $400 apiece, and still made money. Similar lots anywhere near this location were being held at from $800 to $1,000.

Thus by judicious handling of real estate purchases we are able to pass on to our customers very substantial savings in cost of their homes. It is a benefit that returns to us many times over in that priceless business asset, a satisfied customer.

Make Home Buying Easy!

(Continued from page 55)

of effort and annoyance? If many do so, the public does not know it. Some will reply, 'Can it be done ethically?' or 'The builders of small houses will not pay what this service costs and is worth.' This is true in part, but a way should be found to convince the public of the value of this service, today available in practically every community, and to make it possible for the average American family to obtain the benefit of architectural talent. The public will then make use of it and pay a fair price for it."

It is quite true that the architect should be able to see the entire home-building project through if he is willing and the customer is able to pay the price.

Perhaps the best plan for many builders is to arrange a co-operative agreement between himself, the architect, and financing institution. By working out details it should be possible in this manner to have one party arrange all matters with the prospective builder. Thus home-building would be made simple and easy.

The Building and Loan Steps In

To safeguard more adequately their investments, building and loan institutions are taking a greater part in supervision of construction. Many contractors are simplifying the process of home-building for their customers through working agreements with the building and loan. Such an arrangement enables the builder to simplify his customer's problem to a maximum degree.

Organization of a number of local groups may be necessary to perfect the home-buying process to the simple and easy procedure outlined in our first few paragraphs. It may be possible to form a working agreement between yourself, an architect, a building supply man, a financial institution, and a realtor. Bringing all the elements of home-building together in this fashion would give the prospective customer specialists in each field, and yet, with proper organization, the process of home-building would be made extremely simple.

Whatever the means employed, the end should be clear—the red tape that hampers and holds back people who would like to own their own home must be eliminated. Competition for the American dollar this year is keener than ever. The rivalry among builders is nothing compared to the rivalry that exists between you and luxury-vendors for the public's money. As business revives the selling efforts of these countless competitors will be redoubled, which makes it imperative that home-buying be made many times easier than it has ever been before.